

# DWR NEWS | *People*

FALL 2008



*Climate Change  
Impacts on  
California's Water*



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**D**uring the July 2008 HydroVision 2008 Conference, Director Lester Snow made the following presentation:

It really is an interestingly opportune time for this conference...a unique opportunity to discuss climate change, water management, energy.

I noticed one of the subtopics or subtitles of

the conference is Anticipating Change and it's interesting because we do need to anticipate change but what we need to get more people to recognize is that change already happened.

Those that would deny climate change are not even looking at the newspaper...they're not even realizing what is happening today...and that has been a challenge for us.

You know hydropower is an essential part of California's power and water management system...and therefore, and a lot of people don't get this, it's an essential part of the state's economy.

The State Water Project, which is one of the largest water projects in the country...certainly the largest operated by any state, has over 50 percent of its power as clean hydro. It varies from year to year...I think we average probably around 57 percent. It's not only the clean energy but it's also our ability to supply water.

But, as I already mentioned, climate change has already changed our hydrograph. It's not something that's in the future...it's a reality now that many of you recognize. By 2050, conservative estimates are that we'll lose 25 to 40 percent of the Sierra snowpack...completely changing the way we have to manage the system.

While no one year is an indicator of climate change or a manifestation, this year was one of the odder years we've had for intense snowfall and snowpack accumulation in January and February...and then the system shut off. If those patterns had continued, we would have had a well above normal snowpack year.

Instead, we're in a critically dry year and in the throes of a drought.

What we also know about climate change is that future droughts are going to be longer and drier. That doesn't seem to be a question...it's just how much longer and how much drier.

Current flood peaks and future flood peaks are going to be higher than we've experienced in the past. Our water management world has changed...and continues to change. The past is no longer a basis to predict the future...and that may be the most difficult thing to instill in people. They want to look at the past and do a trend and say that's how we plan for the future...and that is not going to be adequate. We must adapt for water supply, for ecosystem health, and for clean power.

**Governor Arnold Schwarzenegger** has been a consistent leader on climate change and greenhouse gas reduction. The Greenhouse Gas Reduction bill, AB 32, those of us in the state...that's how we refer to it, is a landmark piece of legislation aimed at substantially reducing greenhouse gases.

He is a supporter of national action, and increasingly...even just within the last week, a major critic of federal inaction that has not put this country in the forefront of dealing with greenhouse gases. Governor Schwarzenegger is also an ardent supporter of water infrastructure investment...including the construction of additional major reservoirs in this state and finding that balance between investing in hardscape, as it might be, as well as in soft practices to reduce greenhouse gases.

The time for action is now...it's not for some time in the future when it's more convenient. Our understanding of these changes has increased greatly over the last several years...phenomenally, actually...over the last several years. As I said a moment ago, we can no longer rely on the past to predict the future. We must plan for change. We must lead to a new way of managing our precious water resources.

We are resource managers...natural resource managers...even if we're a dam operator controlling the flows in the rivers...we're managing the precious natural resource. So we have to be interested in the health of the watershed, the health of the ecosystem, water quality, flood management, availability and reliability of clean power...those are all our responsibilities.

It's an exciting time and I refer to it as an *opportunity rich environment*. So every time we get a new court action restricting the way we can operate our system...or we have drought...it's an opportunity to implement change.

*Finally, on behalf of Governor Schwarzenegger, I want to welcome you to this State Capitol...to California. Enjoy the conference, enjoy Sacramento, and anticipate change...because it's already here.*

*Thank You.*

Arnold Schwarzenegger  
Governor

Mike Chrisman  
Secretary for Resources

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## *DWR Plans for Possible*

# CLIMATE CHANGE IMPACTS ON CALIFORNIA'S WATER

*By Margarita Macias*

*"Future droughts  
will likely be  
more severe...  
future floods  
will be bigger."*

DIRECTOR  
LESTER A. SNOW

*Above: Lake Oroville in 2008.*

**D**uring the past two years, California has moved rapidly to begin addressing the growing and complex threat that climate change poses to the state, with the Department of Water Resources (DWR) playing a central role in the State's efforts. DWR Director **Lester A. Snow** states quite firmly that "planning for and adapting to the uncertainty that climate change brings to water resources is the most significant challenge before California's water managers this century."

"Future droughts will likely be more severe," he says, and "future floods will be bigger."

Director Snow goes on to say that "the California water community must immediately broaden its focus on climate change to include a diverse suite of actions for climate change *adaptation*. Water supply and flood management agencies must act now to accommodate changes already here due to warming temperatures."

Determining how California water resources can potentially be impacted by climate change and what to do about it are issues now being addressed by a team under the direction of DWR's Executive Manager for Climate Change, **John Andrew**.

"We believe that we have already started to realize some climate change effects in California," says Andrew, "particularly in the areas of flood management and sea level rise."

"We're seeing flood peaks on Central Valley Rivers that are higher than anything we've witnessed in the last century and these higher flows could have a significant impact on our levee system, particularly levees in the Delta which are not in the best shape."

Projected sea level rises would also compound the danger to the Delta's fragile levees.

"Within the last century, sea levels have risen seven inches," states Andrew. "It's projected that in the next half-century, sea levels will rise anywhere from seven to more than 20 inches. This kind of sea level rise will not only have a dramatic effect on the Delta, but on our coastlines as well."

## Visible Effects of Climate Change

A healthy snowpack is essential to ensuring an ample California water supply. In the Sierra Nevada, the winter snowpack holds an average 15 million acre-feet of water that is released in the spring and early summer. Using historical climate and hydrologic data and climate modeling, DWR projects that the Sierra snowpack will experience at least a 25 percent reduction by mid-century. That, obviously, would have a significant effect on statewide water supplies, by shifting more runoff from the spring to the winter, when it may be unable to be stored as water supply.

At the same time the overall snowpack is expected to diminish, rising temperatures may melt the snow earlier in the year, and storms may result in more direct rain runoff. Coupled with more intense storms due to climate change, these factors could result in major Central Valley flood events.

Andrew says these and other potential climatic changes pose daunting challenges for California's water managers, but the actual scope of the problem is still uncertain and even somewhat unknown. Nonetheless, DWR and other State authorities have already taken steps to address climate change issues and make California water resources sustainable in the long term.

*In September, DWR's Executive Manager for Climate Change John Andrew spoke during the Climate Change Adaptation Policy Workshop sponsored by DWR, the Western Governor's Association and the Western States Water Council. Technical approaches and policy and management implications were discussed.*



## DWR Initiatives

Within California, there has been recognition at both the Executive and Legislative levels regarding the role climate change could play in the lives of Californians. In September 2006, **Governor Schwarzenegger** signed Assembly Bill 32, which mandated that by 2020 California reduce carbon emissions to 1990 levels — a 25 percent reduction.

Once the emissions reduction mandate was given to State agencies, DWR joined the California Climate Action Registry in 2007 to calculate the size of its carbon footprint. "That was the first step in determining what our emissions are at DWR," says Andrew, "and how we could potentially reduce them."

A carbon footprint is defined as the total amount of greenhouse emissions related to a company's business operations. Greenhouse gas (GHG) emissions are believed to be contributory factors in climate change.

So, all of DWR's activities from daily operation of State Water Project facilities to the purchasing of office supplies are being measured and calculated.

One major SWP area targeted for reduction is energy consumption. The SWP's initial carbon footprint was calculated at less than one percent of the State's total, mainly because the SWP generates and uses hydroelectricity — which has no carbon footprint and is essentially clean energy. But DWR also uses power generated by less pristine technologies, including the coal-burning Reid-Gardner plant in Nevada.



On that subject, Andrew says: "In the 1970's, DWR sought to diversify its energy consumption in response to the ongoing oil crisis. In 1983, we started using electricity from the Reid-Gardner plant. DWR gets about 1.4 billion kilowatt-hours from Reid Gardner while its electricity needs range to more than eight billion kilowatt-hours. We've estimated that when our Reid-Gardner contract expires in 2013, our carbon footprint will be reduced well over 30 percent below our 1990 levels, which is more GHG emission reductions—and sooner—than that required by AB 32."

Along with eliminating Reid-Gardner from DWR's power portfolio, many climate change adaptation strategies are in the works. They include initiatives focusing on water use efficiency, system re-operation, carbon sequestration, sustainable business operations, and incorporating climate change into planning and decision-making.

## Planning for Climate Change at the Local Level

Statewide meetings for *California Water Plan Update 2009* are underway, and according to Andrew, one of the most effective tools to help local communities prepare for potential climate change issues is Integrated Regional Water Management (IRWM). DWR's IRWM Program is designed to create a water plan unique to the needs and available resources of a particular region.

A number of California regions have already put regional water resources management in place. *California Water Plan Update 2005* identified these regional plans as an effective way to manage water resources at the local level.

When regions use Integrated Regional Water Management Planning, it allows them to diversify their individual water portfolios, which helps them prepare for potential climate change impacts. Such regional planning also allows greater flexibility when addressing statewide water needs.

*In September, the Climate Change Adaptation Policy Workshop was held in Irvine.*

"IRWM planning is different from the way that we used to do business," says Andrew. "We used to build huge dams and canals and think on a more statewide scale. Now we have more flexibility at the local level to meet the needs of individual regions."

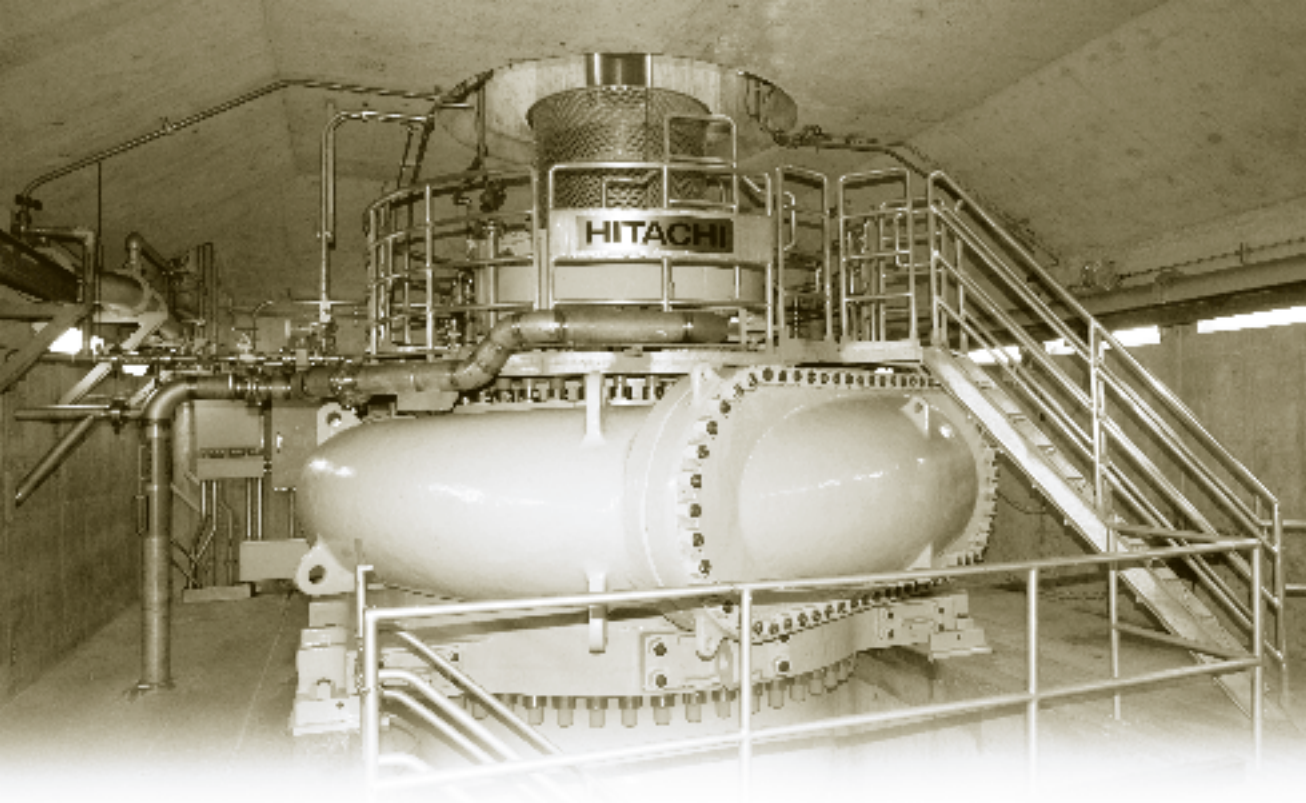
DWR Director Snow says: "As Californians move beyond recognition of the impacts of climate change, state and regional water managers must simultaneously embrace both mitigation and adaptation approaches. While some climate change predictions are indeed dire, the good news about climate change is that adapting to its impacts is complementary to adapting to the other major changes—in population, land use, and the economy—in California's future."

In October, 2008, DWR released its climate change white paper, entitled "Managing an Uncertain Future; Climate Change Adaptation Strategies for California's Water," available at [www.climatechange.water.ca.gov](http://www.climatechange.water.ca.gov)

## DWR's Climate Change Matrix Team

**Executive Sponsor: Mark Cowin**

Linda Ackley	Veronica Hicks
Manucher Alemi	Arthur Hinojosa
Curtis Anderson	Ray Hoagland
Michael Anderson	Jeanine Jones
John Andrew	Rich Jurichich
Tracy Billington	Elissa Lynn
Nikki Blomquist	Dave Mraz
Steve Bradley	Mike Myatt
Francis Chung	Amy Norris
Rob Cooke	Roy Peterson
Holly Cronin	Jessica Pearson
Gordon Enas	Glen Pearson
John Engstrom	Steve Roberts
Y-Nhi Enzler	Maury Roos
Megan Fidell	Greg Smith
Tom Filler	Rick Soehren
Dan Flory	Jim Spence
Mike Ford	Harry Spanglet
Dan Fua	Michael Werner
Jim Goodridge	Rick Ramirez
Dale Hoffman-Floerke	



# DWR GREENING

*By Amy Norris*

**W**hen it comes to climate change and water management, the Department of Water Resources (DWR) has two challenges, adaptation and mitigation. DWR hydrologists have been exploring the impacts of climate change on water supply for some time. Proposed adaptations, such as additional reservoir storage and water conservation, are well known. Mitigation, or reducing the greenhouse gases caused by water management and business practices, has been a more recent goal.

**Veronica Hicks** is the Chief of the recently formed State Water Project (SWP) Power and Risk Office. The Office evolved from a single project team that was created in 2004 to assess the State Water Project's future energy needs. The team was tasked with identifying energy resources to replace long-term power contracts that were expiring, as well as aligning newly developed business practices with existing standard utilities practices.

*"This represents another milestone in our efforts to increase the energy efficiency of the State Water Project and reduce the carbon footprint of our operations."*

DIRECTOR LESTER A. SNOW

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*DWR's first pump replacement project was completed at the A.D. Edmonston Pumping Plant. This first pump alone will save energy equivalent to that generated by a 12-acre solar panel farm.*



In 2006, the Legislature adopted Assembly Bill (AB) 32, which mandates a program of regulatory and market mechanisms dedicated to achieving quantifiable, cost-effective reductions in Greenhouse gas (GHG) emissions in California. Energy efficiency and renewable energy are essential elements for meeting AB 32 goals. It was a natural step to create the new office from the project team already investigating the SWP's future energy requirements.

According to Hicks, DWR soon began focusing on ways to reduce its carbon footprint. "The SWP supports the intent of the Legislature and Governor's Office in their goals to

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*"The CCAR is a private non-profit organization originally formed by the State to develop and promote accurate and consistent GHG reporting standards and tools for organizations."*

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reduce carbon emissions. DWR joined the California Climate Action Registry (CCAR) in June 2007. We began the detailed work to gather documentation and refine our analysis of carbon emissions from power sources that we use."

The CCAR is a private non-profit organization originally formed by the State to develop and promote accurate and consistent GHG reporting standards and tools for organizations. CCAR members voluntarily measure, verify, and publicly report their GHG emissions. This information is used to identify the best and most efficient way to further reduce GHG emissions. 2008 is DWR's first year reporting to the CCAR for GHG emissions for calendar year 2007.

In 2006, the SWP derived an average of over 50 percent of its energy from clean, renewable hydroelectric generation. When DWR's power contract expires in 2013 for energy from Reid-Gardner, a coal fired plant in Nevada, it will be replaced with cleaner energy sources. Possible sources include energy from state-of-the-art combined-cycle natural gas plants, and renewable resources, such as wind, solar and geothermal, and more hydro.

Additionally, DWR has undertaken extensive energy efficiency improvement projects at Hyatt Powerplant and Edmonston Pumping Plant to make generators and pumps run as efficiently as physically possible, resulting in substantial energy savings. In May of 2008, the first pump replacement project at the A.D. Edmonston Pumping Plant was completed. This project replaces four of the 14 pumping units at the plant to improve State Water Project (SWP) energy efficiency. When completed in 2011, the replacement of the four Edmonston pumps, combined with the efficiency improvements already done at Hyatt Powerplant in Oroville, will save enough energy to power 33,000 households for a year, or the equivalent to taking 11,000 cars off the road.

"This represents another milestone in our efforts to increase the energy efficiency of the State Water Project and reduce the carbon footprint of our operations," said **DWR Director Lester A. Snow**, speaking at A.D. Edmonston Pumping Plant, located about 30 miles south of Bakersfield.

Hicks says that SWP emissions are "comparatively on the low end of the scale." In fact, because of its large hydro-generation resources and a relatively small increase in project capacity, GHG emissions associated with the SWP's

*(Article continues on page 10)*

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*When completed in 2011, the replacement of the four Edmonston pumps, combined with the efficiency improvements already done at Hyatt Powerplant (left) in Oroville, will save enough energy to power 33,000 households for a year, or the equivalent to taking 11,000 cars off the road.*





# WASTE REDUCTION AND RECYCLING TO BE GREEN

As part of DWR's commitment to greening our business operations and to sustainability, DWR employees and offices are encouraged to beat last year's totals for waste diversion.

## Some of the tips for greening include:

- Use the Environmentally Preferred Purchasing (EPP) Program and Office Depot's "Green List" to buy recycled products whenever possible.
- Have your division's recycling coordinator provide information to employees on what, where, how and why to recycle.
- Improve the documentation of existing waste reduction activities by your office/location to serve annual reporting purposes.
- During office moves, plan to have plenty of recycle bins/containers to accommodate the recyclable materials.
- Create a local "Green Pastures" reuse area in your office to reutilize gently used office products.

To recognize outstanding greening efforts by DWR employees and organizations, the Director will begin including awards in the areas of waste reduction and recycling during the 2008-2009 DWR Annual Awards.

Any questions on what is recyclable or how you can help DWR in recycling, contact your division's recycling coordinator or contact DWR's Waste Reduction and Recycling Coordinator Vicki Camp at (916) 653-5906 or [vcamp@water.ca.gov](mailto:vcamp@water.ca.gov)

For Waste Reduction and Recycling Programs, visit DWR's greening Web site at <http://aquanet.water.ca.gov/dwrgreen/index.cfm> or the California Integrated Waste Management Board's Web site at: <http://www.ciwmb.ca.gov/Recycle/>

## DWR'S DIVERSION CALCULATIONS FOR 2007

PROGRAM	EXISTING	TONS
Business Source Reduction	X	42.580
Material Exchange	X	16.415
Beverage Containers	X	2.043
Cardboard	X	66.920
Glass	X	0.668
Newspaper	X	3.107
Office Paper (white)	X	29.423
Office Paper (mixed)	X	1,112.394
Plastics	X	1.118
Scrap Metal	X	380.780
Special Collection Events	X	4.780
Other Materials	X	3.600
Xeriscaping, grasscycling	X	843.920
Self-haul greenwaste	X	3.000
Tires	X	48.690
Scrap Metal	X	75.045
Wood waste	X	78.490
Concrete/asphalt/rubble (C&D)	X	299.406

**Total Tonnage Diverted** 3,012.379

**Total Tonnage Disposed** 3,713.992

**Total Tonnage Generated** 6,726.371

**Overall Diversion Percentage**

(Tonnage Diverted / Tonnage Generated) **44.8%**

## HAZARDOUS MATERIALS

(Programs not included in calculations)

PROGRAM	EXISTING	TONS
Electronic Waste	X	(7.119)
Batteries	X	(18.406)
Used Oil/Antifreeze	X	(148.460)
Paint	X	(25.240)
Universal Waste	X	(0.536)
Other Hazardous Waste	X	(54.025)

operations have not increased significantly since 1990. Consequently, DWR currently meets the goal of AB32, which is to reduce emissions to 1990 levels by 2020. After the Reid Gardner contract expires, the SWP will produce more than 30 percent below its level of GHG emissions in 1990.

The SWP faces some unique challenges when it comes to reducing emissions according to the goals of AB 32. Hicks explains, "Though it generates electricity, the SWP is not an electrical utility that provides power to retail customers. Our primary mission is flood control and water delivery; it is water that drives the power side," said Hicks.

"Especially with the drought and the Wanger decision, we have limited windows of time when we can move water. A lot of renewables like wind power are intermittent. It's not a firm supply." In other words, DWR cannot rely solely on renewable energy because the water must be moved during timeframes when renewable sources may not be producing the energy needed. The SWP needs a firm source of power to guarantee water supply reliability.

When it comes to quantifying DWR's emissions through the CCAR, the SWP is only part of the equation. The Department is also measuring its fuel use in everything from vehicles, generators, backhoes to leaf blowers. Electricity consumption is also measured for each of its buildings, whether leased or owned by the Department.

Hicks says it was actually an easier job to quantify emissions from the SWP than the business operations side. **John Engstrom**, DWR Facilities Planning and Development Manager, has the difficult job of presiding over gathering the business operations data, interpreting it, and coordinating with Veronica's staff to log it into the online CCAR database.

"Not all data was centrally located in our enterprise business system, 'SAP,' said Engstrom. "We could find records of fuel purchases, but how was it used? CCAR wants to know whether it was burned in a leaf blower, generator, or a van. We had to work with field divisions and outlying areas to help us collect more detail."

Besides gathering data for CCAR, Engstrom and his team have made strides in implementing 10 initiatives for greening business operations. These include Purchasing Services Office disseminating environmentally preferable purchasing practices to our Department's buyers to encourage more eco-friendly purchasing; organizing a green week to bring more awareness to green operations; reducing DWR's junk mail with the help of mailroom staff and a non-profit Web site; and promotion of electronic resources that can be found on the Web. In addition, the Division of Technology Services is planning in the near future to update the Data Center to reduce electricity use.

Engstrom is also working on a green policy for the Department that will include increasing energy efficiency for buildings, reducing greenhouse gases for the vehicle fleet and continuing to promote greening DWR workplace practices, procedures and maintenance.

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*After contract expiration for the Reid Gardner plant (below), State Water Project will produce more than 30 percent below its level of Greenhouse gas emissions in 1990.*





*“We’re being very proactive about educating ourselves and quantifying, reporting and managing our emissions.”*

VERONICA HICKS



Other State action that affects DWR’s business practices is the Governor’s Executive Order S-20-04 which preceded AB 32, and required the greening of buildings. It requires reduction of grid-based energy, such as electricity and natural gas, 20 percent by 2015. DWR has complied with the first phase by listing our buildings, which have meters registering gas and electricity use, on the Energy Star portfolio system overseen by Department of General Services. The next phase is looking at ways to reduce energy.

The new SWP Southern Field Division Headquarters in Pearblossom is an exciting new project that will exceed the requirements of S-20-04. It is planned to be the Department’s first LEED (Leadership in Energy and Environmental Design) Gold Rated building. The 20,000 square foot building is being designed in-house by Division of Engineering architects and engineers, who are also overseeing the construction.

Legislation of the last few years, such as AB 32, and Executive Orders like S-20-04, have led to exciting changes and real action towards reducing DWR’s carbon footprint.

Now that DWR’s data has been submitted to the CCAR registry, data must be independently verified by a certified consultant. Engstrom is hopeful DWR will pass this phase of the process, though many entities fail on their first, or even second try. Despite some limitations, he credits SAP with what he hopes will be the Department’s success.

“We’re a pretty complex organization for tracking energy because DWR purchases power for its SWP facilities. We also have a large fleet, and a lot of facilities. Trying to collect that and make sure it meets verifiers is intensive. SAP was a very useful tool to extract data. Other departments are using paper invoices to collect data for reporting to CCAR.”

Hicks concluded, “We can be proud because the SWP is doing its part to minimize greenhouse gas. We are able to reach these goals and we already have a fairly clean portfolio while balancing the need to move water when it needs to be moved. We’re being very proactive about educating ourselves and quantifying, reporting and managing our emissions.” ■

## DWR CELEBRATES “GREEN WEEK”

**T**o educate DWR staff on sustainable practices to transform their workplace and homes, DWR employees participated in their first annual “Green Week” on April 21-26.

As part of this week of promoting a “greener” environment, employees found tips on AquaNet for each day.

- Monday -The focus was the 3R’s – Reduce, Reuse, and Recycle. It promoted cleaning office areas by allowing reuse and recycling of unneeded office supplies and old paperwork.
- Tuesday – Earth Day and DWR’s role in promoting its principles with respect to our mission.
- Wednesday – Environmentally Preferred Purchasing (EPP). The article reviewed where and how to purchase products with high recycled content.

- Thursday – Carbon Footprint (DWR’s CCAR registry)
- Friday – E-waste education- How, what, and where to recycle electronic waste products.
- Saturday – E-waste drop off day, Saturday, April 27th
  - This day was a voluntary effort for all employees to participate in disposing electronic items. Items dropped off by employees that day included TV’s, computers, stereos, cell phones, and any other acceptable electronic waste.

If you have any questions, contact Nate Frank at the DWR Green Team at [DWR\\_Green\\_Team@water.ca.gov](mailto:DWR_Green_Team@water.ca.gov)





# DATA COLLECTION

## *for Climate Change*

*By Elissa Lynn and Mike Anderson*

*Plans are being made to improve current measurement arrays and to create new network capability in the future.*

California possesses a diverse and complex climate; analyzing its change over time requires a great deal of data. While data collection is conducted by a dozen major State and federal agencies, as well as local agencies, the Department gathers a vast amount of valuable water resource information itself including snow surveys, stream flows, groundwater levels, tide elevations, temperature records, rainfall totals, and runoff rates. Divisions involved in data collection include Planning and Local Assistance (DPLA), Environmental Services, Flood Management, and Operations and Maintenance. Plans are being made to improve current measurement arrays and to create new network capability in the future. Continuing long-term records, tracking currently unmeasured variables, and optimizing technology and dissemination are key goals looking toward the future.

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*Above: Sacramento River at Ord Ferry gauge during the flood of February 1958.*



## Stream gauging

Department staff are working hard to implement advanced technology to collect and disseminate data to help water managers resolve California's complex water challenges. DPLA's Northern District currently maintains a network of 54 stream gauging stations located primarily within the Sacramento River watershed that provide time-series water surface elevation and discharge data as well as some water quality data. About twenty of these gauges are funded by the Department of Water Resources (DWR) Division of Flood Management, and are equipped with radios to provide real-time data. Numerous flood events have been documented by these gauges over the years. The Sacramento River Ord Ferry gauge has been maintained by the Department for its entire period of record beginning in the 1920's, and is currently maintained by DPLA's Northern District. The instruments used at the sites today provide a significant technical improvement over those used in earlier periods. **Danny Cervantes** has about nine years of experience maintaining stream gauging stations with the Northern District during his 18 years with the State. He says not only has the data quality improved, but so has the technology. "It's night and day. Now you can download the data for pda, laptop, or even use a flash card. Plus the software programs let you make sure it's solid, and well Q/A, Q/C'd." Analysis of climate change trends in surface flow will be heavily dependent on the accuracy of these types of measurements.

O&M's Oroville Field Division maintains a number of stream gauges that were originally installed by other governmental agencies, as well as several of its own. The gauges provide calibrated data for a wide range of analyses such as flow and depth frequency and duration, design of bridges and water diversion facilities, water supply availability, and quality of fisheries habitat. This data is all quality controlled, which means rigorous analysis is done on it to remove errors and outliers, thus providing the highest quality data set possible. All the gauges, especially those with long records can also be used to analyze annual or seasonal runoff trends over the last century. One of the oldest is the Feather River near Oroville gauge that was installed by the United States Geological Survey (USGS) in 1902, making it a great candidate for climate study.

DPLA's Central District is responsible for collecting a wide range of data categories ranging from surface water and climatology to ground water and water use. This information can be used to document climate change impacts and support the development of actions to advance policy decisions and future water management actions. Stage recorders that measure affects of ocean tides on river levels, water temperatures, and salinity intrusion all can correlate to factors associated with sea level rise. Central District has 75 surface water data collection sites, including 40 tide stations, eight stream flow stations, and 18 stage stations. Recent and ongoing projects include testing radar technology, vertical control datum conversion, sensor modernization, replacing stilling wells with design analysis bubbler systems, and safer high-water flow measurements. These improvements will allow for better data sharing and coordination in integrated regional water management. But in light of climate change, questions may need to be answered going forward. Are these networks sufficient for addressing climate change? In what way do these work, or do they need to be augmented?

The California Water Plan Update (Bulletin 160) is the only document that computes statewide supply and demand, and DPLA is directly responsible for these calculations. Climate

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*Danny Cervantes, Water Resources Technician II, works on a recently installed gauge located on Mill Creek near Los Molinos.*



change will increase reliance on accuracy, availability and assessment of these figures. Central District Chief **Karl Winkler** says “Water’s so valuable that we need to diligently explore available technology and coordination opportunities to support data management actions to assist with these statewide calculations. Future conditions will require that we work with more demanding tolerances.” In the meantime, DPLA data collectors strive to advance efforts to coordinate and optimize collection efforts and associated evaluations.

## Stage Measurement

Water surface elevation (tide or stage) measurements in the Delta will be critical in determining the impact of sea-level rise in California. Higher sea-level puts additional stress on the aging levee infrastructure. Between DPLA’s Central District and Division of Environmental Services (DES), the Department operates over 100 collection stations in the Delta estuary, according to **Bob Nozuka**, Central District Resources Assessment Branch Chief. A few of the oldest data records go back to the 1920’s, but the bulk of gauges were installed in the 1940’s and 50’s, when the Department became more heavily engaged in the Delta. Five additional stations are being installed this fall in the South Delta, near Tracy Boulevard. Another important set of data are tide forecasts. The Department works with the National Weather Service (NWS) to produce annual navigational tide tables for the ports of Stockton and Sacramento. These tide tables are used by river pilots who navigate deep sea cargo ships entering the ports from San Francisco Bay. Daily tide forecasts are also made that account for weather and outflow conditions. Together, the long-term water elevation records, annual tide tables, and daily tide forecasts will be valuable tools for climate change projections and adaptation efforts in the Delta.

## Groundwater

Another water variable that is becoming more critical, and may be impacted by climate change is available ground water. DPLA’s San Joaquin District (SJD) conducts between 1,000 and 1,200 ground water site surveys per year. **Mike McGinnis** of SJD says these readings account for about one third of the groundwater measurements taken in the District. The others are conducted by the Bureau of Reclamation and local water districts. Other DPLA District offices also collect groundwater measurements. With current concerns about drought, these valuable measurements can provide information for climate change adaptation. Mike says, “In previous droughts such as 1987 to 1992, the groundwater elevations can drop three to five feet per year and fifteen to twenty feet over the entire drought period in some wells in the San Joaquin Valley unconfined aquifer.” How these basins fare during changeable supply periods will allow for better water management policies in the future.

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*Water Resources Technician II Charlie Peery uses a water level meter to measure the ground water level in a monitoring well at a project on Red Rock Ranch near Huron, California. After measuring the ground water level, the bucket on the right will be used to collect some of the ground water for water quality samples to be sent to Bryte Lab for analysis of total dissolved solids, dissolved selenium, and some mineral constituents.*





*...valuable snowmelt data can be used, “as the first line of defense against flooding, for water supply forecasts, and also to measure climate change.”*

DAVE RIZZARDO



## Snowmelt

Water supply impacts are of great concern in the State, which gets 60 percent of its agriculture and urban water supply from the Sierra Nevada Mountains. Data collected for forecasting water supply conditions in California includes snow water content, snow depth, precipitation and stream runoff. Supplemental information such as temperature, relative humidity, solar radiation, and wind is also provided by some automated sensors. This data enables forecasters to project statewide snowmelt runoff. Recent shifts tell us about climate change impacts in the Sierra Nevada. Less of the water year's runoff is occurring in the April-July (A-J) period, which represents the snowmelt portion of runoff. Over the last century, there has been a reduction in A-J runoff for both the Sacramento and San Joaquin River Systems, but the reduction has been more pronounced in the Sacramento River System, due to its lower average watershed elevation. This indicates a trend toward warmer winter storms with higher snow levels which produce less snow. Warming temperatures cause seasonal snow lines to rise to higher elevations, at the approximate rate of 500 feet for every 1°C (2°F) increase in temperature. Few observations are in place to track the dynamics and location of the rain/snow transition zone. This zone plays a critical role in both the snowpack and flood dynamics, so additional investment in high-terrain monitoring is needed for climate studies.

Across California, there's been a shift in the peak snowmelt runoff on the Sacramento and San Joaquin River Systems to about one week earlier since the first half of the 20th century. **Maury Roos**, Chief Hydrologist in the Division of Flood Management puts the estimate of average loss of snowpack so far at around 10 percent of 20th century “normal” levels. Using the figure 1°C warming leads to a 500 foot elevation in the snow level, projections are for a loss of at least 25 percent of snowpack by the middle of this century. This is based on current temperature trends and average climate model projections of CO<sub>2</sub> induced warming.

*Above/Below: Snow survey being conducted at Phillips Station along Highway 50 by Frank Gehrke (right) and Dave Hart of the Division of Flood Management's Hydrology Branch.*

Measuring Sierra Nevada snowpack and water content is one of the Department's well-known data collection activities. **Dave Rizzardo**, Chief of the Snow Surveys Section in the Division of Flood Management, says valuable snowmelt data can be used, “as the first line of defense against flooding, for water supply forecasts, and also to measure climate change.” Many of the 268 snow courses are actually measured during the season by cooperating agencies, but Department personnel do maintain most of the courses used in the program. Near the first of the month from January through May, cooperative snow surveyors trek into the Sierra; in some cases to very remote locations. A snow sampling tube with a cutter end is driven through the snowpack, measuring depth. By weighing the snow core, the water content (water equivalent) is obtained. The same points are sampled several times each winter to observe changing conditions throughout the season. There are also 129 automated snow sensors (pillows) up and down the Sierra Nevada. Many of the telemetered sites also provide precipitation, air temperature, wind, and solar radiation data, which will be useful in California climate change detection and analysis.



## Flood Control

There is an increased risk of flooding for the state in a warmer climate. Higher snow lines will compound flooding potential because of increased volume of direct runoff in the watershed. The Division of Flood Management is expanding a pilot program that will benefit present-day flood risk reduction, as well as assist in climate change adaptation. During flood situations, it can be helpful to conduct reservoir releases in a well-timed fashion. The Forecast-Coordinated Operations (F-CO) program allows operators to make controlled releases ahead of and during major flood events allowing for more water supply storage during the flood season (October through April). The F-CO program is considered one of the most cost-effective measures to improve flood control. It will help minimize the risk of exceeding river channel capacity and increase the warning times to communities along the major California rivers and downstream of flood control reservoirs without impacting the water supply of the upstream reservoirs. Conserving storage is critical if the expected climate change impacts of higher snowlines, decreased snowpack, and earlier snowmelt are realized. This may lead to updates to applicable water control manuals (or at least flood control curves) issued by the U.S. Army Corps of Engineers (USACE).

The pilot project for F-CO is taking place over the Yuba-Feather River System, and is a collaboration between the Department, USACE, the Yuba County Water Agency, and the California-Nevada River Forecast Center (CNRFC). Key initiatives are to enhance communication between local, state and federal agencies; improve data gathering and



exchange; and utilize the most recent advancements in weather and river forecasting. Twelve new precipitation gauges, two new snow pillows and five new stream gauges were put into place between 2005 and 2007 for this endeavor. As F-CO expands into the San Joaquin System over the next few years, the program anticipates installing additional sensors for temperature, snow, rain, and stream flow. Since southern Sierra mountains have a higher average elevation than those in the north, this would make an interesting area of research on changing snowpack and runoff. Although it would take some time to establish a long-term record, these new gauges will be a valuable investment for flood concerns today, as well as for climate analysis in the future.

*(Article continues on page 18)*

**Above:** John Deam, Water Resources Engineering Associate, at the new Paradise Fire Station precipitation gauge.

**Below:** The Sutter Bypass levee failure in the 1997 floods.





# EARLY HISTORICAL ACCOUNTS

By Amy Norris

In keeping with its tradition of leadership on water issues, DWR has been at the forefront of climate change study and impacts on water management. It is predicted that temperatures will rise from one to six degrees Celsius in the next 100 years. It is now widely held that the rise in temperature will directly impact water resource management in California by causing a loss of at least 25 percent of the snowpack, a rise in sea level that will pose risk to Delta levees, and potential intrusion of salty water into the Delta and groundwater basins.

DWR's investigation into the impacts of climate change began over 20 years ago. **Maury Roos**, DWR's Chief Hydrologist, led the earliest investigations into the possibility that warming could be impacting the state's water resources.

In March of 1987, Roos wrote a paper for the Pacific Climate Workshop that identified changes he had discovered in the Sierra snowmelt. He and **Bob Burnash** with the National Weather Service had discussed the possibility that greenhouse gases might lead to climate change. Though both were initially quite skeptical, Roos believed if there were something to it, he would see a change in the snowmelt ratio, and he did find one.

In January of 1989, the American Association for the Advancement of Science (AAAS) held a meeting in San Francisco to discuss climate change. In an effort to acquaint the water community with climate change issues presented at the San Francisco meeting, they contacted Roos to set up a seminar at DWR's headquarters office.

In December of 1989, the impact that warming could have on snowpack was first discussed at a snow co-operators meeting in Oakhurst, California. Roos then worked with **Kari Smith** of the California Energy Commission, on the water portion of the CEC's report on climate change in California. The report covered greenhouse



*"It is now widely held that the rise in temperature will directly impact water resource management in California..."*

MAURY ROOS

gases, warming and identified potential loss of snowpack as the most likely and significant change for water. Sea level rise and the possibility of more floods were also mentioned.

Roos presented papers at the Oceans Conference in Seattle in September of 1989, and another at the 1990 Western Snow Conference which was later published in their annual Proceedings.

However, with the 2005 update of Bulletin 160-the California Water Plan, climate change finally became a major issue. Water Plan stakeholders requested climate change be more thoroughly represented than it had been in the previous 1993 and 1998 Updates. DWR complied with a chapter that addressed Global Climate Change and its impact on snowpack changes, hydrologic

patterns, sea level rise, rainfall intensity, water demand and aquatic life.

In 2006, DWR also published the report, "Progress on Incorporating Climate Change into Management of California's Water Resources." This report grew from Governor Arnold Schwarzenegger's Executive Order S-3-05 establishing greenhouse gas emissions targets for California, and requiring biennial reports on potential climate change effects on several areas, including water resources.

The effect of warming on precipitation is of greatest concern to water resource managers. Historically, the state has 15 million acre feet of water storage in snowpack. Currently, about 10 percent of that snowpack or 1.5 million acre-feet, has already been lost.

DWR is still trying to provide leadership to the water community. According to Roos, there now seems to be broad support for the idea that things are changing and changing fast enough to warrant more investigation, adaptation and mitigation. A number of DWR people are now actively involved in climate change work. ■

## Other Data Collection

Another great source of data is the California Irrigation Management Information Service (CIMIS) network. CIMIS is a program in the Office of Water Use Efficiency that works in partnership with the District Offices and local farmers. The network was established to assist farmers in determining their irrigation needs for crops. **Jan Carey** with Central District reports that there are strong cooperative efforts in place with local entities to maintain these many stations. This growing network began in 1982, and is now archiving sufficient data for climate analyses. One-hundred thirty solar-powered automated CIMIS stations are in place statewide recording solar radiation, air temperature, relative humidity, wind speed, and, through calculation, evapotranspiration.

Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). ET is especially valuable in climate change studies, as warmer temperatures will lead to changes in the amount of water needed by plants, and the amount contributing to atmospheric cloud production. With 20-million Internet visits in 2007, it is likely this data is already being tapped for climate studies. The Web address for CIMIS information is [www.cimis.water.ca.gov](http://www.cimis.water.ca.gov).

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*Jan Carey of the Land and Water Use and Conservation Section in Central District explains how the California Irrigation Management Information Services (CIMIS) network works during the California State Fair.*

Real-time data from each of these networks is collected and made available on the California Data Exchange Center (CDEC) at <http://cdec.water.ca.gov/>

In addition to that collected by the Department, data provided by external agencies is also posted, making it a robust real-time data source. For additional data, and quality-controlled data unavailable in real-time, the Water Data Library is the site to check. <http://wdl.water.ca.gov>

In addition to these products, State Climatologist **Mike Anderson** takes this data and creates monthly reviews of California's climate. These reviews are posted on the state climatologist Web site near the middle of the month at <http://www.water.ca.gov/floodmgmt/hafoo/csc/>







*On August 28, 2008, the DPLA Data Collection Team meeting was held at the California State Fair. Using "California's World Class Delta" as a backdrop, the group reviewed collection methods, equipment, data management and accessibility to assist water managers in evaluating complex water resources management challenges and assist in policy formation.*

## Partnership

The Department sees partnership as a key to developing a larger climate change database. The National Weather Service Cooperative Observer (NWS Co-Op) Program has long been considered the premier climate data network nationally, with data being processed and archived at the National Climatic Data Center. In an attempt to address deficiencies in the NWS Co-Op network with respect to monitoring for climate change, the National Oceanic and Atmospheric Administration (NOAA) started a program known as the Climate Reference Network. The program aims to install and maintain high quality precipitation and temperature measuring stations for homogeneous measurements that can tie into historical observations for the purpose of climate change detection and monitoring. Currently California has three sites operating with an additional four planned or in the process of being installed. Department personnel work with NOAA and members of the Western Region Climate Center to coordinate these activities.

Partnership in other agencies' weather and climate programs can also add to the data collected. Over the next five years, Department personnel, Scripps Institute of Oceanography, and NOAA's Earth System Research Laboratory (ESRL) will be adding to the network of extreme precipitation observation. New instrumentation of soil moisture, snow level radar and atmospheric water vapor sensors are being installed at several locations across the state. In addition, NOAA's ESRL will be developing computer modeling tools to make use of the data to assist both state and federal forecasters with the timing and location of extreme precipitation events. This data will be useful for studies involving peak flows, flood events, and basic climatology of the region.

## Looking Ahead

The future of the Department's data collection as it relates to climate change will be to build upon current networks, invest in data analysis and archiving, establish better monitoring of the critical rain/snow transition line, contribute to or augment the atmospheric monitoring networks of partner agencies, establish an interim range of sea level rise estimates for short-term planning purposes, and identify further research and modeling studies necessary for small- or regional- scale climate change assessment. Executive Manager for Climate Change, **John Andrew**, says, "The uncertainty that remains in the rate and magnitude of long-term climate change must be reduced. There are currently large gaps in our hydrologic observational network in areas of California most subject to climate change. Improved data collection and a robust monitoring network will help identify trends, provide for better real-time system management, evaluate and, if necessary, correct adaptation strategies."

Anticipated changes in California's climate will create many challenges in the field of water resources. The tremendous effort of Department employees in maintaining, archiving and disseminating data will help the State monitor and document California's climate.

**Danny Cervantes** of DPLA's Northern District puts it this way, "How do you predict the future if you don't keep track of the past?" While looking at the past is part of the solution, for climate change the past may not even be sufficient for predicting the future. Therefore, stable funding for longer periods will be key to determining, and adapting to climate change in the future. ■

# THE CALIFORNIA STATE CLIMATOLOGIST

By Elissa Lynn

**D**isorder may be too harsh a word to describe **Dr. Michael Anderson's** cube, but it's not an easy place to navigate. With records dating back to the 1870's, some of it on aging yellow vellum, his desk is the repository of California's climate history. His favorite archive is the Southern Pacific Railroad snow charts from before the turn of the century. Six-foot long scrolls flecked with blue ink graph the snowfall and snow depth over Truckee, Summit, Cisco, Emigrant Gap and Blue Canyon. You'll find a copy of the original archive of the United States' hottest, yet disputed, temperature record; Death Valley (Greenland Ranch at the time) 134°F, on July 10, 1913. There are microfiche files of the federal climate program that was ended in the 1970's, hand-written and leather-bound logs of Santa Maria's weather in the 1940's, and a faded, original Bulletin 56, Survey of Mountainous Areas dated 1955, which led to the selection of the Feather River as the top of the State Water Project.

This material is all part of the State Climatologist's Office and Program. It is rare to find a state climatologist housed within a State agency. Thirty-nine state climatologists are on university campuses. But in California, the Office is maintained in the Division of Flood Management. Dr. Anderson's goal is for the Office to become the focal point for hydrometeorologic climate data for California. He's coordinating with the Western Regional Climate Center (Reno, Nevada) and various national programs, including the National Weather Service, the U.S. Department of Agriculture, and the National Climatic Data Center.

"We should work together to provide the best services for the State."

Michael Anderson grew up in Lakewood, Colorado, the middle son of a Bureau of Reclamation engineer. He received a

Bachelor of Science in Civil Engineering in 1991 from Colorado State University, graduating cum laude. He got his Master's from the University of California, Davis in 1993. His Ph.D. thesis, "On the Physics of Drought," was completed in 1998.

Shortly after coming to the Hydrology and Flood Operations Office as an engineer, managers found out about his atmospheric sciences background, and asked him to take on the role of State Climatologist. Prior to Dr. Anderson's tenure, **Bill Mork**, State Meteorologist from the early 1980's until 2005, carried out the climate duties. **Jim Goodridge** held the post from 1953 to 1983, and was registered as California's State Climatologist with the National Climatic Data Center. Mr. Goodridge, incidentally, is now a retired annuitant living in Chico. He still updates and contributes data to the program.

Revival of the Office took approximately one and a half years. Reinstatement as a recognized office by the American Association of State Climatologists was completed in 2007, and Dr. Anderson's position was established by DWR in 2008. The Office monitors and distributes climate related data to interested parties, conducts climate-related outreach activities and educational materials, and supports climate research within the state. Of course, climate change is one of the key issues that the Office plays a role in. (See Data Collection article, page 12). Dr. Anderson's schedule looks a lot like his desk; quite crowded! Whether assisting in the development of new monitoring networks for the

Department, providing technical expertise to other agencies, or speaking across the country on California's climate, he says he loves his topic material. ■



# RISAS, CLIMATE RESEARCH, & DWR

*By Jeanine Jones*

**T**he Regional Integrated Sciences and Assessments (RISA) program of the National Oceanic and Atmospheric Administration (NOAA) was established in the mid-1990s to support research that addresses climate-related issues of concern to decision-makers at state or regional levels. NOAA funds university-based RISA centers that help provide an information translation function from the academic sector to users of climate information. NOAA now funds eight RISA centers (commonly just referred to as RISAs) nationwide – and DWR is working with three of them – the California Applications Program at the Scripps Institution of Oceanography, the Western Water Assessment at the University of Colorado, and the Climate Assessment for the Southwest at the University of Arizona. The RISAs provide information about natural climate variability and human-induced climate change, often in the form of newsletters or climate forecasts. They are also intended to provide NOAA with information on designing a proposed national climate service, a new federal function that could become the climate equivalent of the National Weather Service.

Climate change and water is a key focus area at these three RISAs. DWR has worked with the RISAs on subjects such as global climate model output information for the 2006 Climate Action Team report to the Governor and the Legislature, articles for DWR's 2008 drought update report, and a 2008 science workshop on U.S.-Mexico border region climate change for the Border Governors Conference. DWR has also entered into a Memorandum of Agreement (MOA) with NOAA, acting on behalf of the three RISAs, for coordination of climate-related research. As the MOA notes, "Improving the understanding of climate and climate variability is vital to management of California's water resources. The state's water supply availability is determined by natural climate variability, evidenced in droughts and cyclical patterns such as the El Niño-Southern Oscillation. Understanding natural climate variability, as well as that stemming from human-induced climate change, is essential for operating the state's water supply and flood control projects and for adapting to climate change."

The RISA program is important to DWR and to other water agencies because it is currently the only program that serves the critical role of identifying, translating, and transitioning potentially relevant research funded by the federal Climate Change Science Program to actual resource managers and

other end users. Presently, periodic assessment reports prepared by the Intergovernmental Panel on Climate Change are the only comprehensive source of broadly accepted information on expected future impacts of climate change, but the assessment reports present information only at the global scale. Climate scientists at the RISAs work closely with the user community on practical applications of current research at the state and regional scale, and help form networks with others in the academic community willing to work on real-world problems. DWR is, for example, collaborating with its three RISA partners to produce a "Water Year 2009 Crystal Ball Science Workshop" scheduled for November 21st. The purpose of this event is to use best-available science – from global climate models, from National Weather Service forecast products, from ongoing climate observations, and from paleoclimate analogs — to estimate likely water supply conditions in the coming year – wet, dry, or average. ■



*Left to Right: DWR Director Lester Snow presented DWR's first-ever awards for Climate Science Services at the Climate Change Water Adaptation Summit in Santa Monica in 2007 to Brad Udall (Western Water Assessment, University of Colorado, Jeanine Jones of DWR, and Gregg Garfin (Climate Assessment for the Southwest (CLIMAS), University of Arizona). The award's purpose is to recognize ongoing assistance provided by members of the academic community who have been working closely with DWR on planning for climate variability and change. (Not in photo are award recipients Connie Woodhouse of CLIMAS and Daniel Cayan and Michael Dettinger, both of the California Applications Program.)*



## *California Hosts Border Governors Conference,* **CLIMATE CHANGE A FOCUS**

*California is honored  
to host this conference  
and I am honored to  
be your chairman.  
Together we have  
accomplished a great  
deal over this past year.*

GOVERNOR ARNOLD SCHWARZENEGGER

*By Jeanine Jones*

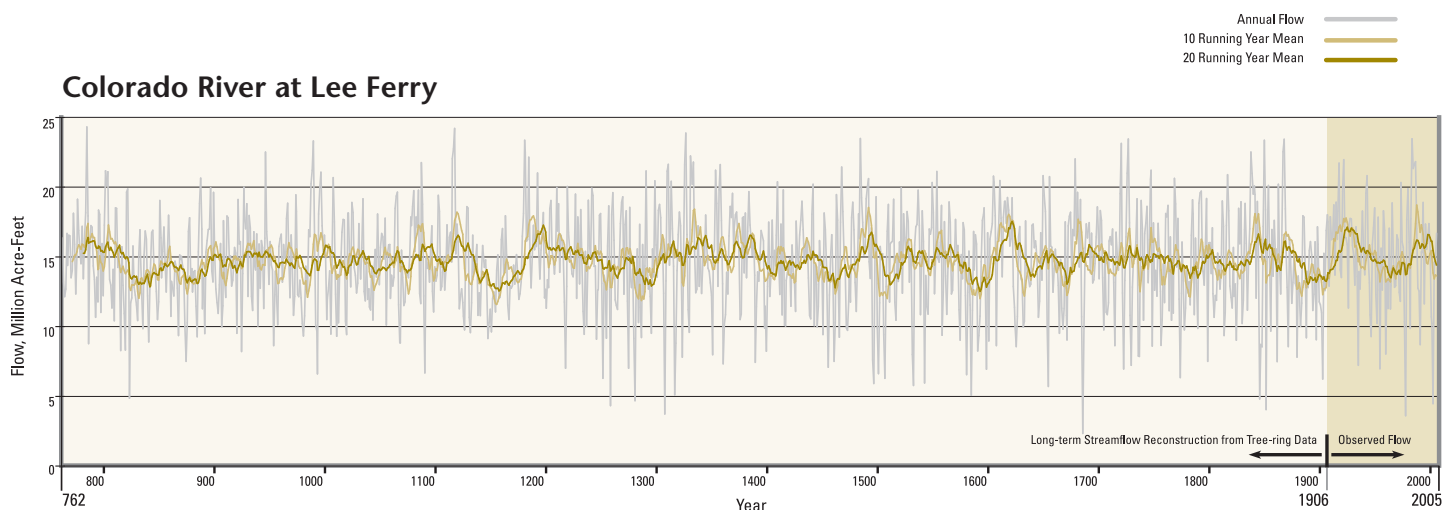
**I**n August, California hosted the XXVI Border Governors Conference (BGC) in Hollywood. The BGC is an organization composed of the 10 U.S. and Mexican states that share the border – California, Baja California, Arizona, Sonora, New Mexico, Chihuahua, Coahuila, Texas, Nuevo León, and Tamaulipas. The purpose of the organization is to provide a venue for the states to discuss and resolve the unique issues they face in the border region, which, based on the 10 states' combined economies, ranks as the third largest economy in the world.

"California is honored to host this conference and I am honored to be your chairman. Together we have accomplished a great deal over this past year. The Mexican border states have joined our Western Climate Initiative, for instance, to help fight global warming. We are working with the federal governments to tackle the problem of millions of abandoned scrap tires that pose a public health and environmental risk

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*Above: Moderator Judy Maben (right) of the Water Education Foundation and panel speakers during the May 2008 Water Education Foundation Border Water Infrastructure Conference sponsored by DWR and WEF in San Diego*





and we have begun discussions on managing water resources during drought conditions,” said **Governor Arnold Schwarzenegger** at the conference.

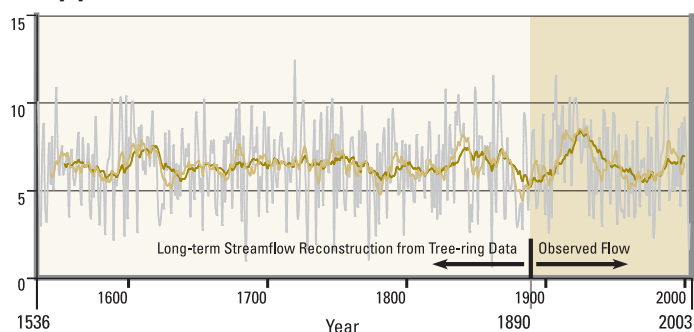
The responsibility for hosting the conference – where the governors of all 10 states meet and ratify joint declarations (see sidebar) that constitute an annual work plan for actions of mutual interest -- alternates between the U.S. and Mexican states. Last year the host state was Sonora; next year’s host will be Nuevo León. The joint declarations are developed and implemented by 10-state work tables that meet throughout the year and cover subjects such as water, agriculture, tourism, health, education, and energy. Within California DWR is responsible for supporting the recently created Water Work Table. This year and next year California and Nuevo León are the co-chairs of the Water Work Table.

Each year the BGC host governor selects a theme or priority topics for the year. The selected priority topics for the XXVI conference were economic development, green technology, and climate change. To carry out the climate change topic for the Water Work Table, DWR sponsored a science workshop on border-area climate change with the University of Arizona, and used information derived from that workshop to publish a special report on border water and climate change. Copies of the bilingual report are available from DWR’s publications desk or online at <http://www.water.ca.gov/news/newsreleases/2008/081508bgcreport.pdf>

As described in the report, the border region – which is arid and whose population growth rates outstrip national averages – is vulnerable to climate change impacts.

The international Colorado River and Rio Grande basins are the major river basins of the U.S. southwest/Mexican northwest, with a relatively small percentage of the high elevation headwaters area in each basin being responsible

### Upper Rio Grande River at Del Norte, CO



### Border State Population Estimates and Projections (millions)

State	2005 Estimate	2030 Projection
California	36.1	46.4
Arizona	5.9	10.7
New Mexico	1.9	2.1
Texas	22.9	33.3
Baja California	2.8	5.1
Sonora	3.3	3.8
Chihuahua	2.5	3.1
Coahuila	4.2	5.4
Nuevo Leon	2.4	2.8
Tamaulipas	3.0	3.8

Source: U.S. Census Bureau and Consejo Nacional de Población



## THE BORDER GOVERNORS

Arizona	<b>Janet Napolitano</b>
Baja California	<b>José Guadalupe Osuna Millán</b>
California	<b>Arnold Schwarzenegger</b>
Chihuahua	<b>José Reyes Baeza Terrazas</b>
Coahuila	<b>Humberto Moreira Valdés</b>
New Mexico	<b>Bill Richardson</b>
Nuevo León	<b>José Natividad González Parás</b>
Sonora	<b>Eduardo Bours Castelo</b>
Tamaulipas	<b>Eugenio Hernández Flores</b>
Texas	<b>Rick Perry</b>



for contributing the majority of the runoff used throughout the basins. Projected warming and drying due to climate change will further stress already over-allocated resources available from these river systems. The U.S. southwest/Mexican northwest lies within a region that some climate scientists characterize as a zone of potentially expanding desertification due to changes in atmospheric circulation patterns stemming from human-induced climate change.

Drought is already a commonplace event in the border region and a recurring aspect of natural climate variability. Long-term records of reconstructed runoff in both the Colorado River and Rio Grande basins indicate that the basins have experienced droughts more severe than those in the relatively short period of the measured historical record. Interest in managing drought is a common theme among the border states; accordingly one of the joint declarations from the XXVI BGC (see sidebar) calls for the Water Table to hold a binational science conference on drought in 2009, while one of the declarations from last year called for the Rio Grande states to develop a proposed definition of "extraordinary drought" for purposes of administering the 1944 U.S. –

Mexico water treaty. (DWR will be organizing the 2009 drought conference, which will be held in San Diego in March.)

The border states are also keenly interested in improving water infrastructure to help cope with water supply challenges and to meet growing urban needs. Joint declarations adopted

*The Border Water Infrastructure Conference sponsored by DWR and the Water Education Foundation in San Diego.*

*California Hosts Border Governors Conference, Climate Change a Focus*





California Speakers during the Border Water Infrastructure Conference included Rita Sudman (far left photo on page 24), Halla Razak of the San Diego County Water Authority (second to right), and Jeanine Jones of DWR (right).

by the governors last year, for example, called for increased federal appropriations for maintaining existing federal and international water infrastructure, and for improving efficiencies of water conveyance infrastructure. Recognizing the high level of interest in border water infrastructure and the large unmet needs for financing infrastructure improvements, DWR held a bilingual border water infrastructure conference in San Diego in May with the Water Education Foundation and prepared a bilingual video titled “Border Infrastructure, the Crucial Ingredient” which was shown at the XXVI BGC. A key point made at the conference was the need to focus on investigation of regional infrastructure projects (such as regional conveyance projects), a subject of interest for the Water Table. Historically, federally-funded financial assistance made available in the border region has been geared toward assistance for smaller individual projects, such as water and wastewater treatment plants for individual communities.

The 10-minute border water infrastructure video, developed in part from information at the conference, provides views on priority areas for infrastructure investment, and can be seen at <http://www.water.ca.gov/news/>

The Water Work Table plans to coordinate closely in development of plans for improving water infrastructure with partner international agencies – the North American Development Bank (NADB) and Border Environment Cooperation Commission (BECC) – that administer infrastructure financial assistance. NADB and BECC have documented nearly \$1 billion of drinking water and wastewater infrastructure needs in the border region. ■

*“The border region – which is arid and whose population growth rates outstrip national averages – is vulnerable to climate change impacts.”*

#### 2005 Population Estimates (millions), Selected Municipalities

Municipality	2006 Estimate
San Diego	2.9
Las Vegas	1.7
Phoenix	3.9
El Paso	0.72
Tijuana	1.4
Mexicali	0.85
Ciudad Juárez	1.3

Source: U.S. Census Bureau and Consejo Nacional de Población  
U.S. figures are for metropolitan statistical areas

## 2008 WATER WORK TABLE JOINT DECLARATIONS

- Organize and convene bi-national science conference on drought in 2009, to include the consideration of factors such as climate variability and change, and share information on present and future water supply needs.
- Urge the federal governments of both countries to improve the infrastructure of the hydrometric and climatological monitoring network in the United States-Mexico border region.
- Pursue greater engagement with the federal governments of both countries in reviewing requests for financial assistance and seek joint state-federal decision-making processes regarding how water infrastructure projects are funded in the United States –Mexico border region.



*MWD Official Briefs Congressional Committee on*

## **QUAGGA IMPACTS IN CALIFORNIA, WESTERN UNITED STATES**

*By Pete Weisser*

**T**he spread of quagga and zebra mussels to Southwestern states in 2007 and 2008, signals the potential for invasive mussels infestation throughout the West. Added annual costs to water agencies could exceed \$250 million.

This is the projection of **Ric De Leon**, Ph.D., who as Microbiology Unit Manager, Metropolitan Water District of Southern California (MWD), is battling the largest infestation of quagga mussels in California, from Colorado River sources.

"The presence and spawning of quagga mussels in the Lower Colorado River and in reservoirs in Southern California pose an immediate threat to water and power systems serving more than 25 million people in the Southwestern United States," said De Leon.

"If these invasive mussels are not controlled," he warned, "the entire Western United States could be impacted."

About 1,800 water systems in Western states serve 47.5 million people, estimated De Leon. Increased costs will occur, he warned, "If mussel proliferation continues in Western waterways."

"Approximately 1,200 water treatment plants operate in the Western United States and each one could potentially incur costs for facility improvements and annual maintenance," he reported. Citing a 1995 National Zebra Mussel Information Clearinghouse Study that indicates an average annual cost of \$214,360 for invasive mussels per water treatment facility, De Leon estimated the potential cost for safeguarding the 1,200 treatment plants in the Western U.S. "Could be in excess of \$250 million if invasive mussel spread is not controlled."

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*Photo by Brianne Noble of DWR*



*“The presence and spawning of quagga mussels in the Lower Colorado River and in reservoirs in Southern California pose an immediate threat to water and power systems serving more than 25 million people in the Southwestern United States,”*

RIC DE LEON, PH.D., MICROBIOLOGY UNIT MANAGER

De Leon provided this overview of invasive mussel impacts on June 24 in testimony before a Water and Power Subcommittee of the House Committee on Natural Resources.

After reporting on efforts by MWD to combat intensive quagga infestation from the Lower Colorado River, De Leon recommended that Congress provide federal funding for infrastructure protection and to support research and development for more effective control of invasive mussels. Reported De Leon:

“Metropolitan is the nation’s largest provider of treated drinking water. Each day, during a normal year, the district moves more than 1.5 billion gallons of water through its distribution system, delivering supplies to 26 member agencies covering a six-county area, which encompasses 5,200 square miles in Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties.”

Quagga entered the Metropolitan system from intakes in the Lower Colorado River, where quagga were discovered in January 2007. The invasive mussels spread quickly through MWD’s 242-mile Colorado River Aqueduct to storage reservoirs and on to other water agencies receiving supplies from MWD.

“Metropolitan receives approximately 740,000 to 800,000 acre-feet per year from the Colorado River and will spend \$10 million to \$15 million annually in operations and maintenance costs to address quagga mussel infestation in its Colorado River Aqueduct and terminal reservoirs.

“Initial capital costs for design and installation of facilities are \$7.2 million. However, it is anticipated that these costs will be substantially higher over the next few years,” reported De Leon.

MWD quagga control efforts include infrastructure and engineering adaptations to thwart quagga colonies and chlorine applications to destroy larvae.

“Chlorination is the most frequently used means to control mussel larvae entering water systems,” reported De Leon.

Thus far, MWD has appropriated \$7.2 million to upgrade chlorination facilities in its Colorado River Aqueduct and at two additional locations in its system, the outlets of Lakes Mathews and Skinner.



“Long term permanent disinfection systems will need to be designed for control of mussels throughout Metropolitan’s (system) and other water systems in the Western United States,” predicted De Leon.

Other agencies in California treating Colorado River water to combat quagga include the Imperial Irrigation District, Coachella Valley Water District and the Palo Verde Irrigation District.

Major users of lower Colorado River water outside California, which also confront quagga challenges, include the Central Arizona Project (up to 2.2 million acre-feet annually) and the Southern Nevada Water Authority (300,000 acre-feet).

De Leon reported that, thus far, quagga mussels have been detected only in the southern region of California. Zebra mussels have been found in one Northern California reservoir, San Justo Reservoir, in San Benito County, in January 2008.

“The State Water Project moves approximately 3 million acre-feet a year and the Central Valley Project handles approximately 6 million acre-feet,” said De Leon. “If quagga and/or zebra mussels began to proliferate in these systems, the cost of control measures would be significant.”

“Economic impacts on waterways and facilities operated by the Bureau of Reclamation in the Western states are likely to be very significant,” De Leon theorized.

“For example, the potential economic impact for upgrades to 13 hydropower facilities in the Columbia River Basin alone have been estimated at \$23.6 million with estimated chemical costs of \$1.3 million per year.” ■

## DFG Reports Online Posting Of Invasive Mussel Guidebook

The Department of Fish and Game (DFG) recently reported the online posting of a new guidebook to help water managers and recreationists take part in the fight against invasive quagga and zebra mussels. To visit the guidebook, visit: [www.resources.ca.gov/quagga](http://www.resources.ca.gov/quagga)



## *DWR Ambassadors:*

# REGIONAL COORDINATORS

*By Mike Durant*

It was two years ago when **Mike Inamine** and URS consultant **Loren Murray**, of DWR's Levee Repairs and Floodplain Management Office, traveled to West Sacramento to present the Critical Levee Repairs Project at a public meeting. When they arrived, they were surprised to find that West Sacramento was also hosting a DWR Integrated Regional Water Management Program public meeting in an adjacent room, including a module on flood protection.

"We had no idea they were going to be there, and they didn't know we'd be there, and in fact West Sacramento staff wanted to attend our meeting, too," Inamine said. "I was a little embarrassed. It was a case of the right hand not knowing what the left was doing."

"Over the ensuing months, the FloodSAFE program began rolling out a number of related programs involving the same stakeholders and encountering the same coordination problems of that fateful day in West Sacramento," said Inamine.

Inamine, having successfully used matrix management to coordinate and communicate the construction of State Water Project facilities in the past, conceived a plan to implement regional coordination to minimize situations like this in the future.

Today, Murray and five other DWR employees are out to help make sure DWR keeps track of activities department-wide, so its programs and people don't trip over one another. They're part of the developing Regional Coordination Program headed by Supervising Engineer **Chris McCready**.

Historically, DWR has communicated with local governments, stakeholders, and the public program-by-program

and office-by-office. Occasionally, stakeholders have been contacted by multiple DWR programs, sometimes within days of one another.

Even within the Department, with today's large workloads, new programs, and unprecedented performance pressures, DWR programs and offices may be unaware of each other's meeting calendars and could wind up scheduling overlapping meetings with the same target audience. "In fact, by increasing coordination, we anticipate greater efficiency and, therefore, reductions in work obligations for DWR program staff," McCready said.

McCready and her team are participating in the development and promotion of new solutions, such as shared electronic planning calendars, to cut down on possible meeting conflicts and support greater accessibility to DWR programs.

Besides assisting DWR teams in coordinating meetings with external audiences, the coordinators will help those audiences penetrate what to them can sometimes be a confusing bureaucracy.

"It's always worried me when a stakeholder calls and I have to refer them to someone else in the Department; I worry that they're going to get lost in the bureaucracy," said acting Regional Coordinator **Brian Smith** in the San Joaquin District. "I always let them know that if they can't find the answer to give me a call back."

The myriad of DWR programs and activities can be baffling to the public, but they can also be difficult to track for the people who work here. Another objective of the Regional Coordination Program is to provide a resource for





*Left to Right: The Regional Coordinators include Bob Yeadon for the Delta, Brian Smith for San Joaquin District area, John Pierre Stephens for Central District, Loren Murray for Sacramento metropolitan, Scott Rice for the northern Sacramento Valley, and Scott Woodland for San Joaquin County.*



*“DWR’s Division of Planning and Local Assistance and its District Offices – Northern, Central, San Joaquin, and Southern – have a long, successful history of coordinating local assistance programs.”*

CHRIS MCCREADY, SUPERVISING ENGINEER

Department staff to direct stakeholders to when asked about other DWR programs. In addition, the regional coordinator is a resource for Department staff to better understand interrelationships between their own programs, projects, and stakeholders and other DWR activities. In keeping with today’s water management arena, DWR programs are growing in number and complexity, and the resulting increase in DWR/stakeholder interactions reinforces the need for regional coordination.

“DWR’s Division of Planning and Local Assistance and its District Offices – Northern, Central, San Joaquin, and Southern – have a long, successful history of coordinating local assistance programs,” said McCready. **Pierre Stephens**, the regional coordinator in Central District said, “What we’re doing now is building on existing coordination with local agencies. We’re going to take it to another level.”

Why another level now? McCready explained that DWR’s recent push for regions to manage water in a more integrated manner has caused a communication explosion. “DWR needs to carry a consistent message as its programs and people enter those discussions.”

DWR is very active in certain regions of the state – another reason for the coordination team. Take **Bob Yeadon**, for example. He was recently named regional coordinator in the Delta. He has the big job of keeping all DWR programs, surveys, meetings, and activities from bumping into one another. “I see a lot of meetings in my future,” he said.

Communication goes both ways. Working with the Division of Flood Management, **Scott Rice**, regional coordinator for

the northern Sacramento Valley, said, “The program allows us to better inform DWR management and staff about what’s going on with our stakeholders – what their needs are.”

“These regional coordinators are essentially department ambassadors,” McCready said. “They’ll offer stakeholders and department staff consistent points of contact, consistent messages, and consistent service.” The team may grow depending on Department activities around the state.

#### The Regional Coordination Team:

- **Scott Rice**, a consultant with the Division of Flood Management Levee Repairs and Floodplain Management Office, is regional coordinator for the northern Sacramento Valley.
- **Scott Woodland**, with the Division of Flood Management Floodplain Mapping Office, is regional coordinator for San Joaquin County.
- **Pierre Stephens**, with the Central District, is regional coordinator for the district’s service area.
- **Loren Murray**, a consultant with the Division of Flood Management Levee Repairs and Floodplain Management Office, is regional coordinator for the Sacramento metropolitan region, including Yolo and Solano counties.
- **Brian Smith**, with the San Joaquin District in Fresno, is regional coordinator for the district’s service area.
- **Bob Yeadon** is the full-time regional coordinator for the Delta. ■

## Metropolitan Water District of Southern California

By Gabriella Saracino (Photos Courtesy of The Metropolitan Water District of Southern California)

**T**he Metropolitan Water District of Southern California (MWD), the largest of the 29 State Water Project Contractors, provides about half the water used by nearly 19 million people in six counties throughout the Southern California coastal plain area. Headquartered in Los Angeles, Metropolitan delivers an average two billion gallons of water per day to a 5,200-square-mile service area.

"As General Manager of MWD, I have the responsibility of managing Metropolitan's strategic priorities – maintaining water supply reliability; finalizing and helping implement Sacramento-San Joaquin Bay-Delta solutions, ensuring Metropolitan's financial strength and capabilities and increasing the development of local water supply projects throughout Southern California," said MWD's General Manager **Jeffrey Kightlinger**, who became General Manager in February 2006 after serving four years as the district's General Counsel.

During Kightlinger's 13 years with Metropolitan, he has worked in a variety of areas, such as environmental issues, water rights, Colorado River, water transfers, and storage programs. While working for the U.S. Environmental Protection Agency, Kightlinger spent a year specializing in environmental law at George Washington University in

Washington D.C. He earned a bachelor's degree in history from the University of California, Berkeley and a law degree from Santa Clara University School of Law.

"Metropolitan imports water from the Colorado River and Northern California to supplement local supplies, and helps its member agencies develop increased water conservation, recycling, storage, and other resource-management programs," said Kightlinger.

With nearly 2,000 employees, Metropolitan operates five water treatment plants; nine reservoirs with a total storage capacity of about 1 million acre-feet; 16 hydroelectric plants; and 775 miles of pipelines with some 400 connections to its 26 member agencies. Those agencies serve parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino and Ventura counties.

"I am also working to strengthen Metropolitan's commitment to its employees and the member agencies by ensuring that the district continues its leadership and pioneer role in the water world," Kightlinger said. "I encourage our employees to continue to be innovators, to think out of the box and take calculated risks because that is what it's going to take to help face another challenging year."




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*"I encourage our employees to continue to be innovators, to think out of the box and take calculated risks because that is what it's going to take to help face another challenging year."*

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JEFFREY KIGHTLINGER, MWD'S GENERAL MANAGER

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## History of MWD

The Metropolitan Water District was established after a 1924-29 campaign directed by Pasadena Mayor **Hiram W. Wadsworth**. After its creation by the California Legislature in 1927, Metropolitan's first board meeting was held on December 29, 1928 in Pasadena, California. Metropolitan's member cities began receiving Colorado River water in 1941. The Colorado River Aqueduct stretches 242 miles from Lake Havasu to Lake Mathews, near Riverside.

State Water Project (SWP) water was first delivered to Metropolitan's service area in 1972. MWD's distribution of its SWP water supplies includes 58 percent for residential, 33 percent for commercial and industrial, and nine percent for agriculture. SWP water is also used for groundwater recharge and blending with Colorado River water for salinity control.

In 2000, Metropolitan completed construction on Southern California's largest reservoir, Diamond Valley Lake (DVL), near Hemet in southwest Riverside County. DVL, which has a surface area of 4,500 acres and holds over 800,000 acre-feet of water. The building of DVL provided a new focus on resource management and environmental sensitivity in its creative and extensive use of habitat creation and management.



*Above: The first MWD board meeting was held more than 80 years ago at Pasadena's Huntington (now Ritz-Carlton) Hotel.*

*Background: Diamond Valley Lake, which is the largest Southern California reservoir, can hold 800,000 acre-feet of water. Its capacity is more than six times that of Lake Perris (130,000 acre-feet).*

## Water Conservation Methods

One of the most important challenges for Metropolitan is the current drought. It is critical that Metropolitan continue to provide a reliable water supply for Southern California. Though the reliability of its imported water sources faces unprecedented challenges as the drought continues, Metropolitan continues to develop new and innovative local conservation and recycling projects to help meet demands in its region.

"The Governor's proclamation of a statewide drought is challenging not only for Southern California, but for communities and regions throughout the state," said MWD Press Office Manager **Bob Muir**. "And, declining environmental factors in the Delta have resulted in court ordered restrictions on pumping water through the Delta which has made the situation even more challenging."

Over the past two years, Metropolitan has been forced to significantly draw upon its reserves in order to meet demands in Southern California. To deal with the widespread impact of the drought, conservation is more important than ever. As a result of dry conditions and reduced water supplies, Metropolitan's board of directors approved the largest public education and advertising campaign in the agency's history to urge increased conservation, with a renewed focus on outdoor water use.

"We are urging residents and businesses throughout Metropolitan's service area to reduce their water use, particularly outdoors where up to 70 percent of water is used," said Muir. "To help consumers and businesses, Metropolitan offers financial incentives for outdoor water-saving devices, such as 'smart' water irrigation controllers and rotating nozzles for sprinkler systems."

To further encourage urban water users to save water, Metropolitan offers incentives in cooperation with its 26 member public agencies. Incentive programs include a new

centralized regional water conservation rebate program whereby consumers and businesses can obtain information about water saving rebates and incentives. The "Save Water, Save a Buck" program offers rebates for Southern California businesses, and the "SoCal WaterSmart" program offers rebates to homeowners for the purchase of water efficient devices.

Metropolitan also maintains its Innovative Conservation Program, which offers grants and opportunities for entrepreneurs and other companies to come up with innovative ways of saving water. Companies and individuals develop prototypes and other operations that will save water and those agencies then approach Metropolitan with their ideas. Based on a competitive process, Metropolitan provides grants to pursue these programs and projects.

Recently, Metropolitan helped fund the development of several water-saving devices. One example is the water broom, an efficient combination of broom and mop that allows people to clean driveways and sidewalks but uses a fraction of the water that is used with a hose. Also, Metropolitan helped fund a recycling, recirculating x-ray machine. An average x-ray machine uses a significant amount of water to cool down the machine. By developing technology that recirculates water, each x-ray machine saves up to four acre-feet of water annually.

Metropolitan also offers a competitive grant program for college and university students to develop technology to better manage and conserve water. This program is the Southern California World Water Forum. Metropolitan has partnered with local and national organizations to raise awareness about the importance of water quality and conservation. Partners in this program include the U.S. Bureau of Reclamation, Sanitation Districts of Los Angeles County and Friends of the United Nations. The Southern California World Water Forum is an innovative program which evaluates international, national, regional and local water issues and proposed solutions. "We're working with colleges and universities throughout Southern California to reach out to the students of today as the leaders of tomorrow" Muir said.

Metropolitan and its member agencies are national and international leaders in water conservation and recycling efforts.

"Today, we use as much water as we did in 1991 even though we have added four million more people. We've done that through innovative programs including local resource projects such as conservation and water recycling," Muir said.

The region as a whole now conserves, recycles, and recovers as much as 900,000 acre feet of water a year, which is more than Diamond Valley Lake's total capacity.

"That is a testament to the investment that Southern California has made, and needs to continue to make and this is what is needed up and down the state," said Muir.

## Turning to Desalination

Metropolitan and its member agencies also are turning to ocean water desalination as a source of water supply. Metropolitan's desalination program was identified under its revised Integrated Resources Plan (IRP), which has a projected goal of producing as much as 150,000 acre-feet of water over the next 20-25 years through desalination. The agency is currently working with some of its member agencies on



**Top:** The Robert B. Diemer Treatment Plant located in Yorba Linda is one of five MWD treatment plants and the only treatment plant with an onsite generator. **Bottom:** Wadsworth Pumping Plant, which is located at Diamond Valley Lake, was named for MWD founder Hiram W. Wadsworth.



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*"We need the flexibility to deal with what nature gives us at the time nature gives it to us,"*

JEFFREY KIGHTLINGER

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five proposals and is offering financial incentives to develop ocean water desalination plants. For each acre-foot of water produced, Metropolitan will offer \$250 to the agencies, which include: San Diego County Water Authority, Municipal Water District of Orange County, the City of Los Angeles, Central Basin Municipal Water District, and the City of Long Beach.

In addition, Metropolitan is looking at short-term issues such as implementing its Water Supply Allocation Plan which was adopted by the Board earlier this year. Metropolitan is also working with its member agencies developing a five-year accelerated water supply projects plan and is in the process of updating its IRP which was initially developed in 1996 and updated in 2004. "These are programs that will continue to help guide us in the coming years," affirmed Kightlinger.

## Ensuring a Reliable Water Supply

Extending drought assistance beyond its service area, Metropolitan this summer postponed receipt of a portion of its State Water Project allocation so that the water could immediately be used to irrigate parched Central Valley farms.

"Cooperation up and down the state will be increasingly important as California deals with the drought," said Kightlinger.

Along the same lines, Metropolitan has developed cooperative agreements with agencies in Southern California to ensure a reliable water supply for its customers. Metropolitan is able to store water with some of its

member agencies and retailers in Southern California as well as in the San Joaquin Valley where it has groundwater projects with agencies such as Semitropic, Arvin-Edison, and Kern Delta.

"Those projects have been instrumental in helping Southern California not only build up reserves but also provide flexibility to draw on those reserves during dry years like 2008 when we need those supplies in order to meet demands," said Kightlinger.

Metropolitan's Board of Directors also has authorized dry year transfers as a way of augmenting supplies with its water conservation and transfer program with the Imperial Irrigation District. "Particularly over the last few years we have been looking into the water market for dry-year option water, primarily with growers and agricultural water agencies in the Sacramento and San Joaquin valleys," Kightlinger said.

Metropolitan's mission is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way. Its current efforts to increase conservation, recycling and other projects will help Metropolitan continue to meet the challenges and its mission.

"We need the flexibility to deal with what nature gives us at the time nature gives it to us," said Kightlinger. "In this regard, the State of California is also addressing climate change, which could drastically alter how and when the State receives and distributes its water and the impact it has on snowpack. Having the operational ability to take advantage of water during wet years when nature provides it and when it has the least impact on the environment, is key to our future." ■



F.E. Weymouth Treatment Plant located in the San Gabriel Valley is the first filtration plant built by MWD. Completed in 1940, it now serves Los Angeles and Orange counties. (Above) Aerial of Weymouth Treatment Plant & Live Oak Reservoir



## DWR's Core Competencies Identified for Succession Planning Team

**A**s part of DWR's Succession Planning, 24 DWR employees from a variety of DWR Divisions statewide gathered in Sacramento to identify leadership core competencies on July 22.

"The identification of core competencies is essential in our efforts to enhance and focus our leadership development programs," said Workforce/Succession Planning Team Manager and Chief of Operations and Maintenance **Carl Torgersen**. "Workforce planning will enable us to project the staffing and skills needed for the future activities of DWR. With this information we can better focus our efforts in areas such as recruitment and staff development. Succession Planning is a subset of Workforce Planning and will help us identify projected gaps in leadership roles and take action to fill those gaps."

With more than 30 percent of State government employees eligible to retire this year, the concern is not just top and middle management. It's all the way down to the first line supervisors.

"We're going to have to engage rank and file in how best to develop leadership skills more quickly. If this was just water resources, it would be easier to handle because we would have people in other state agencies who would transfer into DWR's leadership positions, but this is a problem in all State agencies" said DWR Consultant **Karen Arnold** of Future Decisions LLC. "Two years ago, 80 percent of the Energy Commission's leadership was able to retire. We're looking at an unprecedented challenge. Never in the history of America has there been this issue and it is a worldwide issue."

The core competencies sub group was formed from the DWR Succession Planning Team's Career Development Workgroup, which consists of **Ralph Torres, Mark Meeks, Russell Kiriu, Craig Trombly, Sebastian Perez, and Karen Arnold**. This workgroup was tasked to explore opportunities for DWR in terms of career development.

"One of the challenges before we start running down rabbit trails implementing stuff is determining what theme or thread will be constant through what we do," said **Mark Meeks**, Chief of the newly formed Project Management Office.

According to Meeks, the establishment of core competencies will (ultimately) permeate everything. "Training, development, appraisal and recruitment will need to be re-examined in light of these competencies. Everyone will be impacted."

"We don't have an Apollo-type mission that might help in unifying our organization. Unlike Caltrans, DWR's missions are diverse, and each of the supporting organizational cultures that have developed are equally varied," said Meeks. "For example, O&M has a culture. DSOD has a culture. There are parts of the Department that have a well-developed culture and clear sense of mission. Yet, the Department, as a whole, lacks a unifying and defining culture or mission. It's our hope that developing a core set of organizational competencies will help coalesce who we are and desire to become. The challenges facing the Department are enormous and success will only be possible through our coordinated, collective efforts."

### Process of Selecting the Competencies

The four-hour meeting began by giving everyone in the room clarity of what these competencies will do and what competencies are. Then, they looked at mission and goals of DWR. During another exercise, the team looked at what will change in DWR in five years.

Each team was given 67 competency cards, which included the competencies' title and a behavioral statement describing the competency. By giving everyone the same set of cards, they all had the same understanding of each of the competencies.





*Left to Right: During the Succession Planning meeting to identify core competencies, speakers and participants included Career Development Workgroup leader Ralph Torres (page 34), Core Competency Development Team Member Charles Mee (page 34), Core Competencies Team Leader Mark Meeks, and Succession Planning Team Manager Carl Torgersen.*

After considerable, passionate discussion and debate, the team ended its meeting with a list of 12 competencies, including ethics, values, integrity and trust; managing vision and purpose; communication; motivating others; dealing with ambiguity and paradox; planning; political savvy; timely decision making with action orientation; priority setting; strategic agility and organizational acumen; developing direct reports and building effective teams; and managerial courage.

The selection of these core competencies is expected to change the way DWR does its training, development, mentoring, and rotational programs.

"The core competencies are key for succession planning, since it will help give DWR focus not only on recruitment and retention, but also leadership development" said Chief of the Training Office **Russell Kiriū**. "Although the Department had identified specific sets of competencies for lead persons, supervisors, managers and executives, this exercise helped us identify core competencies that should be common with every leader in the Department. It will definitely impact the way we design our leadership training programs, both internally and when working with our external training partners."

The Succession Planning Team has completed a Workforce Planning tool in SAP which was tested in late August. The team has recommended that DWR begin using the tool in conjunction with the annual A&D process. It has developed surveys, which will help enhance recruitment and retention efforts. Ultimately, the results of these and other efforts will be consolidated into an annual report to the Director and a recommended action plan.

"The Team has been doing an excellent job - everyone is enthused about this effort and it will ultimately be of great value to DWR," said Torgersen. ■

## The core competencies development team, which consisted of 15 different divisions, included:

**Rodney Aoki**  
Staff Services Analyst  
Office of Workforce Equality

**Kathie Kishaba**, Chief  
Budget Office

**Kimberly Deane**, Chief  
Admin./Travel and Master  
Data Office  
Fiscal Services

**Sherie Brubaker**, Chief  
Interagency Information  
System Services  
Environmental Services

**Gerri La Rue Higgs**, Chief  
Customer Services Branch  
Technology Services

**Kim Oliphint**, Chief  
Departmental Services Office

**Vicki Price**, Chief  
Management Analysis Office

**Stuart Chan**  
Fuels Manager  
California Energy Resources  
Scheduling

**Frances Chung**, Chief  
Modeling Support Branch

**Tara Smith**, Chief  
Delta Modeling Unit

**Alicia Wong**, Chief  
Admin. and Program Analysis  
Flood Management

**Dean Reynolds**  
Staff L&W Use Scientist  
Office of Water Use Efficiency  
and Transfers

**Bill Pennington**, Senior  
Engineer  
Safety of Dams

**Dwight Russell**  
Retired Chief  
Northern District

**John Pierre Stephens**, Chief  
Water Supply Evaluations  
Section  
Planning and Local Assistance

**Scott Jercich**, Chief  
SWP Prog. Mgmt. Branch  
State Water Project Analysis  
Office

**Lucy Montgomery**, Chief  
Administration Branch  
San Luis Field Division

**Joel Ledesma**, Chief  
Project Operations Support  
Branch

**Pat Whitlock**, Chief  
Engineering Branch  
Oroville Field Division

**Jim Peddy**, Acting Chief  
Engineering

**Mary Ann Benny-Sung**  
Chief  
Administrative Services Branch  
Engineering

**Michael Werner**, Chief  
Power Planning and Contract  
Management

**Charles Mee**, Chief  
Power Markets Section  
SWP Power and Risk Office

# Knowledge Builds a Strong Foundation

**W**ith guidance from DWR's Allied Skills Training Council (ASTC), DWR's support staff has gained a tool to learn more about how DWR operates, from revising DWR's Departmental Administrative Manual to touring powerplants.

"ASTC is a great tool to get to know other people in other units, to call each other for support when needed, learn more about what DWR is about, and how to find out information on procedures, processes, benefits, and travel," said ASTC 2008 Chair **Angela Reynolds**.

Due to the need for support staff training and assistance in advancing to higher positions, the Department's Training Office recommended creation of the ASTC to the Training Committee and Employee Career Development Committees. ASTC was created in 1967, with the first meeting held in 1968.

The Committee acts as an advisory board to the Training Office by assisting with the creation of programs that benefit DWR employees while establishing efficiency throughout DWR. ASTC has also created opportunities for support staff members to participate in annual field trips where they can learn about DWR's State Water Project facilities and federal projects across the State.

"Last year, we took a trip to Southern California," said Reynolds. "We learned about the Santa Ana Pipeline construction, went on top of Seven Oaks Dam, where we have flood bypasses and flood control. It's pretty cool to see all the State Water Project facilities that DWR has worked on. It gives you a different perspective."



ASTC has helped many of its members, such as DWR's **Jane Schafer-Kramer** with her career. An ASTC member since 2001, Jane first joined the Council to learn about the Department's Career Development and Upward Mobility Program.

The Upward Mobility Program provides entry level staff with education they need to progress further in their career.

The program allows DWR to reimburse staff for part of their tuition and book expenses for college classes that are part of an approved upward mobility plan.

Using ASTC as a tool, Jane enrolled at American River College, which offered affordable evening classes and a nationally recognized Geographic Information Systems program, with the goal of becoming a Research Analyst. Since then, she has completed the program, achieved her promotion and continues to take classes to keep up with advancing technology.

"The chair of ASTC sends out an email invitation to all Division Administrative Officers to invite one of their support staff to join ASTC," said Reynolds. "Today, ASTC has members who represent support staff in DWR's Divisions, Districts, and Field Divisions. The committee hopes to gain more members and involvement to fill vacant spots in the near future. "

For more information about ASTC, contact Angela Reynolds at [angela@water.ca.gov](mailto:angela@water.ca.gov) or (916) 653-5942 or visit the ASTC Web site at <http://aquanet.water.ca.gov/training/astc/astcmain.cfm> ■



*Allied Skills Training Council Members and Officers include **Left to Right (Back Row)** Amie Shepard, Manerva Cole, Deanna Butler, Chair Angela Reynolds, Steven Heinbach, Kari Carroll, Margaret Cook, Ashley Glisan. **(Sitting)** Robin Storey, Tina Glorioso, Secretary Samuel Pack, Vice Chair Darla Cofer, Valerie Senquiz. **(Not in photo)** Rebecca Delaney, Andy Lopez, Vickie Flannery, Valerie Cox, Historian Lauren Bisnett, Cynthia Meadows, Keith Morgan, Ronney De Arman, Donelle Black, Debbie Greco, Kristine Clerico, and Leticia Cabrera-Quintero, Crystal Alvarez, and Krista Mason.*



## Pride in the Field

By Anna Torres

**A**t DWR's Dos Amigos Pumping Plant, **Rodd Welch's** assignment as Hydroelectric Powerplant Operator helps keep the powerplant in operation. In the baseball fields of the Los Banos Community, his love for coaching has taken him and his team, the "Los Banos Extreme Baseball Team," to the championship in 2008.

"My son Brevin Welch loves baseball to death, so I basically found other kids with the same desire and love for the game and started a traveling baseball team," said Rodd who started the baseball club in July of 2008 to give children who love baseball an opportunity to continue playing after baseball season ends the beginning of June.

The LB Extreme Team traveling baseball club is a privately funded youth organization for boys aged 11 and under. The team has traveled to places such as Turlock, Chowchilla, Dos Palos, Los Banos, Manteca, and Ceres.

Rodd said the club provides an opportunity for boys to play baseball at the highest national level and at the same time be exposed to higher education through trips to local universities. He said that players are selected not solely on their athletic ability, but also on moral conduct on and off the field.

In July of this year, Rodd's team won the Dos Palos Boys All-Star Travel League Tournament giving them the championship title.

"Winning that tournament in itself was so exciting. It shows that hard work, team chemistry and dedication prevails a lot of times," said Rodd.



*San Luis Field Division employee Rodd Welch (center behind trophy) standing with his team holding championship trophy won during the Dos Palos Boys All-Star League Tournament.*

With all the excitement of winning a championship, he displayed the team's winning trophy in the administration building of the San Luis Field Division.

"I brought the trophy to work and placed it in the Admin Building, so all my employees could see what the kids of Los Banos are capable of," he said.

After winning a championship title Rodd says he definitely plans to continue managing the team.

"This traveling league baseball is becoming a huge thing. Just last week at a tournament, there were over 108 teams playing," he said.

The LB Extreme team is currently accepting donations and planning car washes, bake sales, and other fundraisers to keep the organization going and achieve another successful championship.

Rodd, who joined DWR in 1994, began working in the Apprenticeship Program, then became a Hydroelectric Powerplant Operator for the Oroville Field Division. He later transferred to the San Luis Field Division at Dos Amigos Pumping Plant. ■

## Water Plan eNews Celebrates First Year with an Award

**T**he California Water Plan eNews, which keeps several thousand subscribers up-to-date on the progress of the Water Plan, was given the annual Media Award of the Floodplain Management Association at the group's annual meeting in San Diego in September.

The award was given for California Water Plan eNews' "exemplary efforts on the part of communications media to increase information or awareness of flood issues with the general public."

Water Plan eNews also celebrated its first year with its September 17 edition. It had published each Wednesday afternoon 52 straight weeks. It circulates to more than

4,200 subscribers across the state, nation and more than 200 internationally.

"Our electronic newsletter focuses on the California Water Plan, but we include other news about water resources, including flood, drought, climate change, new technologies – topics we think might be of interest to our subscribers," said **Kamyar Guivetchi**, Chief of DWR's Division of Planning and Local Assistance (DPLA).

eNews is produced by the Technical Publications Office of DPLA with **Mike Durant** as the newsletter editor. The current eNews and an archive of past eNews issues are on the Water Plan Web site at [www.waterplan.water.ca.gov](http://www.waterplan.water.ca.gov). ■

# Skinner Fish Facility Has Protected Delta Fish for Over Four Decades

By Pete Weisser

**F**or over 40 years, the Skinner Fish Facility in the South Delta has provided needed protection to vulnerable Delta fish populations. The facility saves about 15 million fish each year. It began operating in 1968.

Located two miles upstream from the Banks Pumping Plant and just south of Clifton Court Forebay, the facility's huge screens keeps many fish safely away from the powerful pumps that suck water into the State Water Project (SWP).

Named in honor of a Department of Fish and Game (DFG) biologist, the John E. Skinner Delta Fish Protective Facility is a vital salvaging unit for millions of fish, be they migrating salmon or Delta denizens.

The mighty Banks pumps lift Delta water over 240 feet, into Bethany Reservoir, over a mile to the south. From that placid reservoir, water is sent either southwest into the South Bay Aqueduct, via the South Bay Pumping Plant, or released at the east end of the reservoir, via Check Structure Number 1 into the California Aqueduct.

At Skinner, larger fish and floating debris are screened out of the system.

Smaller fish that slip through the screen are diverted from the intake channel, which leads to the pumping plant, into bypasses by a series of metal louvers. These smaller fish travel through a secondary system of screens and pipes, eventually arriving at one of seven large holding tanks.

The cylindrical reinforced concrete tanks measure 20 feet in diameter and more than 20 feet deep. Fish entering the tanks are kept in about 10 to 12 foot depths of water. Fish are lifted from the holding tanks by mechanical buckets.

Removed from the tanks, counted and documented by Department of Water Resources (DWR) staff, the salvaged fish are returned to the Delta in oxygenated tanker trucks.

On a busy day, 250,000 to 500,000 fish are processed through Skinner's screens, pipes and tanks, according to **Sheryl Moore**, DWR's supervisor of the Skinner Fish Facility. Some of the fish are protected under the federal Endangered Species Act (ESA), including the majestic winter run salmon and the miniscule Delta smelt.

To comply with the ESA, Skinner must operate under mandated biological opinions. This requirement means involving as active partners experts from a variety of fish protection agencies, including DFG, the U.S. Fish and Wildlife Service and National Marine Fisheries Service.

"To salvage these fish, we have to follow certain criteria set forth in the biological opinions," explained Moore.

The Skinner Fish Facility was built during the late 1960s by DWR which operates and maintains it. DWR conducts fish collection, documentation and transportation activities 24 hours per day, 365 days a year.

The initial facility held four tanks. A second building was built during 1991 to 1992, adding three more tanks.

In the last decade, an unusual amount of plant varieties have sprung up in the Delta waters, impacting the facility.

In 2005, a \$1.1 million state-of-the-art, automated trash rack cleaning system was added at Skinner, to modernize and improve debris collection at the screen. Looking toward the future, DWR technical staff and SWP managers have studied design and operational changes that may be necessary if invasive mussels, including zebra and quagga mussels, invade the SWP. These mussels can congregate on trash racks and clog small diameter pipes.

Thus far, neither mussel species has shown up in the SWP, though quagga mussels have entered several Southern California water systems via water deliveries from the quagga-infested Colorado River.

"The Skinner Fish Facility has provided significant fish survival protection near our Delta facilities for many years," said **Ralph Torres**, Deputy Director for the State Water Project. "Our belief is that, with needed adaptations and improvements, it can continue to safeguard vulnerable fish populations well into the 21st century." ■



*Sheryl Moore, Supervisor of the Skinner Fish Facility since 2006, standing at count station where fish that come through the Skinner Fish Facility are identified and measured.*



# Truckee River Operating Agreement



On September 6 near the Truckee River (background) in downtown Reno, California Secretary for Resources Mike Chrisman (signing) joined 16 other parties including Secretary of Interior Dirk Kempthorne and Nevada Senator Harry Reid in signing the Truckee River Operating Agreement, which represents 18 years of discussion, negotiation, and cooperation among Federal, State, Tribal, and local agencies and organizations. With the implementation of TROA, an interstate allocation between California and Nevada of the waters of the Lake Tahoe, Truckee River and Carson basins will take effect.

DWR and Resources Agency TROA team attending the event included (Left to Right) John Sarna, David Sandino, Linda Ackley, Resources Agency Secretary Mike Chrisman, Carroll Hamon, Mike Cooney, John Kramer and Erick Soderlund

## Memorials in Honor of Crawford and Alvarado

To honor the memory of DWR divers and San Luis Field Division employees, Tim Crawford and Martin Alvarado, plaques have been installed at and near San Luis Field Division headquarters.

The plaques at the San Luis Field Division Operations and Maintenance Building and the Coalinga picnic area's gazebo read as follows: In honor of Tim Crawford and Martin Alvarado for their years of outstanding and dedicated service with the Department of Water Resources. They will be deeply missed, but never forgotten.

Outside of the Romero Visitors Center, the memorial plaque reads: Dedicated in Memory of Tim Crawford and Martin Alvarado who lost their lives on February 7, 2007, while performing underwater inspections at the Dos Amigos Pumping Plant. They sacrificed their lives to keep the State's water system safe and secure for the people of the State of California.

Crawford, who was a resident of Seaside, worked for DWR for more than 18 years and Alvarado, a resident of Coalinga, worked at DWR for six years.



## New Assignment

### Guivetchi Heads Division of Planning and Local Assistance



**K**amyar Guivetchi, the program manager of Update 2005 (Bulletin 160-05), DWR's landmark update of the California Water Plan, this summer became Chief of the Division of Planning and Local Assistance (DPLA).

As DPLA chief, Guivetchi is in a position to help implement the collaborative process outlined in Update 2005 to meet California's future water needs.

"What I envision is an organization seen by the California water community as a place to go for information, good technical assistance, and public funding," Guivetchi said. "And, I want DPLA to be seen within the Department as an organization that is a good place to work."

Guivetchi joined DWR in 1978 as an Engineering Student Assistant in Central District. One of his first assignments was helping to evaluate fish screening concepts for the proposed Peripheral Canal. In related work, he helped Department of Fish and Game biologists with fish passage studies.

Graduating from the University of California, Davis in 1979 with a Bachelor of Science degree in Civil Engineering, Guivetchi continued to work for DWR as a Graduate Engineering Student Assistant in the Central District's Delta Impacts Analysis Section

from 1980 to 1984. During this period, he provided data for a Delta impacts staff paper on hydrology and water quality and did analyses for the Interagency Ecological Studies Program's Phytoplankton Task Force.

In 1985, Guivetchi joined the Division of Planning's Delta Modeling Section, moved to the Suisun Marsh planning team in 1990, and in 1995 became Chief of the Suisun Marsh Branch in the Office of Environmental Services.

From 2000 until July 29, 2008 when he became DPLA chief, Guivetchi was Manager of DPLA's Statewide Water Planning Branch where he directed the production of bulletins on groundwater management, irrigation water use, and California Water Plan Update 2005.

Water Plan Update 2005 represents a fundamental transition in water resource management and the way state government needs to be involved with regional water planning.

"We have enough water to meet our needs, but it's going to require good investment decisions," Guivetchi told a reporter when Update 2005 was released.

The Update focuses on Integrated Regional Water Management – helping regions diversify their water portfolio strategies and realize the most from local, state and federal resources.

At the helm of the Division of Planning and Local Assistance, Guivetchi can follow the Water Plan blueprint in helping to meet California's water needs as the state continues to grow. ■

## Northern District Staff Honored with Golden Trout Award

*DWR Northern District Resources Assessment Branch Chief Curtis Anderson has joined a select list of California dignitaries as recipient of the "Golden Trout Award" presented by California Trout, Inc.*

*The award recognizes public officials who have made distinguished contributions to the protection of wild trout, steelhead, and their habitats. Anderson was nominated for his efforts while representing the Resources Agency on the Trinity Management Council.*

*Past recipients of the Golden Trout Award include former State Attorney General Bill Lockyer, former Fish and Game Department Director Pete Bontadelli, former Governor Jerry Brown, and former DWR Director Ron Robie.*



## DWR Division Chief Rows for the Gold

In competition with 1,300 rowers from 83 clubs from throughout the U.S., Division of Environmental Services Chief **Barbara McDonnell's** team of 23 female athletes won sixth overall place in the women's category during her first National Championship for rowing.

During the four-day event in Long Beach last August, McDonnell and her boat of four rowers plus coxswain completed the 1000 meter sprint in four minutes 22 seconds, fast enough to make the final race, but out of medal contention. The team overall took home 9 medals in 13 events over the four days of racing. The races featured men and women ranging from ages 21 to 83.

"What I love about the sport is being out on the water, being stronger and more agile than I was in my 20's, the adrenaline rush of racing, the camaraderie of my teammates, and the sense of accomplishment of a good row," said McDonnell.

McDonnell has been rowing for three years with the Sac State Aquatic Center Rowing Club. She trains for races all year with a short break during the holidays. At Lake Natoma, she works out four times a week in two-hour sessions.

"When I was in college, women's rowing was just becoming an Olympic event in the U.S.," said McDonnell. "One of my teammates is part of the first US Women's Crew to row in the World Championships in 1975. They captured a Silver Medal and became known as the Red Rose Crew. There is a book written about the women on this team and how they were selected to become the U.S. Women's Rowing team, how they prepared and how they became so successful in the 1976 Olympics."

In the fall, McDonnell and her team are planning to race in "head races." Although they still row for medals, these 5000 meter races are more for fun. They usually compete in four races, which are held in Petaluma, Port of Sacramento,



Barbara McDonnell (second from right) at 2008 Southwest Regional Championships in Long Beach. (Below) Photo by © sportgraphics.com — McDonnell (front row) with team stroking at the 2008 San Diego Crew Classic in Mission Bay.

Lake Natoma and Newport. They work on technique, race starts, sprints and long, 5000-meter or longer pieces to prepare for these races.

"My proudest moment in rowing has been winning the gold medal at the Southwest Regional Championships in 2006 as part of a novice eight boat," said McDonnell, who has also participated in regional competition during the last three years. "Winning is definitely fun! It got me hooked on racing and I have been chasing another gold medal ever since."

She also races the 2000-meter events where high school, colleges and Master's all compete in the same Regatta, such as the prestigious San Diego Crew Classic. By racing at that event last April, her team became in really good shape for the 1000 meter sprints. In October 2008, her team won a silver medal at the Petaluma Regatta.

"We are always looking for new members who would like to learn how to row, or would like to return to rowing from college days," said McDonnell. "People can contact me for information on how to get started. We also raise money to buy our own race boats and other equipment and sponsor kids to attend the Aquatic Center camp during the summer." ■



## DWR's Francis Chung Addresses United Nations Group in Geneva

**Dr. Francis Chung**, Chief of DWR's Bay-Delta Office Modeling Support Branch, presented a lecture at the Executive Council meeting of the United Nations World Meteorological Organization (WMO) on June 26 in Geneva, Switzerland.

The WMO is a specialized agency of the United Nations, the UN system's authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources.

An offshoot of the WMO is the Intergovernmental Panel on Climate Change (IPCC), which provided information Dr. Chung's modeling group used to produce a 2006 report called "Progress on Incorporating Climate Change into Planning and Management of California's Water Resources."

Through his lecture, "Managing Water Resources under Changing Climate: Experiences from California," Dr. Chung explained the goals, objectives, methods, and some results of DWR's work as a consumer of information produced under the IPCC's lead. He also made a few suggestions regarding how to address uncertainties in future climate projections.

DWR's Modeling Support Branch, which is led by Chung, conducts hydraulic, hydrology, water quality, and systems analysis statewide. During his 27 years with DWR, Chung has been involved in DWR major planning and operations projects. His most recent projects include the enlarged Shasta, North of the Delta Storages, Los Vaqueros Enlargement, Bay Delta Conservation Plan, CalFed, Delta Vision, Isolated Facilities, and real time operations of the State Water Project.

### DWR NEWS/People sat down with Chung in July for this conversation about his Geneva excursion:

*How did it come about that you received an invitation to speak in Geneva...?*

The WMO people contacted me after learning of our 2006 report. I was rather surprised to find out that people on the



other side of the globe were reading what we publish...but they were impressed with the fact that California government was taking a leadership position in combating greenhouse gas and trying to determine what climate change means in terms of water resource management.

*How would you describe the council's reaction to your lecture...?*

The WMO EC is keenly interested in learning how information generated by the IPCC is translated and used at a regional level.

Thanks to Governor Schwarzenegger's strong initiative, California is on the forefront of mitigation and adaptation actions coping with climate change. So, my lecture was like a consumer report for them and it was particularly meaningful since DWR was one of the first agencies to make use of their product.

*What kind of issues were discussed...?*

One area especially important to them was "what do you want the WMO to do for you now?" I guess my basic concern was how do we sort out the multiple different climate change scenarios that we'll be facing by 2050 or 2100. I basically said give us more hard data to better cope with the uncertainties. It's a tall challenge for them. They basically knew that already but it was somewhat refreshing for them to hear it from a consumer. Another issue that I brought to their attention is the weakness of existing Global Circulation Models and accompanying downscaling schemes to project extreme hydrologic events, like floods.

*Is it likely that you may be called upon to give more lectures...?*

Well, they sort of hinted at the possibility of having me, or someone else from DWR, attend the WMO Congress next year...which is a very big meeting. The Executive Council consisted of representatives from about 150 countries. The 2009 Congress would involve thousands of people. ■





# Serving Our Country

**T**odd Percival's interest in the National Guard came from DWR co-worker **Marc Anderson**, who previously also worked for Central District and now works full-time for the National Guard.

"It really seemed cool. The tuition and assistance earned was a great incentive," said Todd about joining the National Guard in September 2006. "I've seen a different part of the world that I would have never seen before."

From January to May of 2007, Todd took Basic Combat Training at Fort Sill, Oklahoma.

"I volunteered for the mission under command of Captain Marc Anderson because I really trusted him and I knew he was a great guy," said Todd.

After three months of intensive training in New Jersey at Fort Dix, Todd was ready for deployment to Balad, Iraq.

"The training was tough. They wanted us to train for 18 hours a day for seven days a week. It was just intense," said Todd. "The reason they make it so hard is that way when you do get over to the country, you've already been pushed to your extreme limit. You know you can handle it and your leadership knows you can handle it. So, they have faith in you and you have faith in your leadership."

During his nine-month deployment from September 2007 to April 2008, Todd escorted convoys and conducted recovery missions. He was a gunner in a Humvee, part of the security for convoys delivering supplies from base to base.

"It made me grow up," Todd said. "Maybe I was a boy going in and I came out a man. When I got back home, a lot of people noticed the change. There were so many things that I took for granted before, like just being able to talk to my family. Sometimes, I had to get up in the middle of the night due to the time difference and dress up to march across the base and stand in line and wait to use the telephone."

Although Todd did get a week off in February to visit his family, he missed spending holidays, birthdays, and other events with his family.

"My family, along with DWR's Central District Office was very supportive of me. They sent me large care packages," said Todd. "I know it was very difficult for my mother to provide me a ride to the airport as I departed for military service. She was dropping her kid off to go back to combat. That's something that no mother wants to do."



Todd's mother is Cindy Percival, an Associate Governmental Program Analyst with the California Energy Resources Scheduling Division. She is not new to the life of the military since she comes from a family that had members in the military.

"Both my father and brother retired from the military. My youngest son is considering a career in the military," said Cindy. "I think it is a great opportunity to learn a trade and to get a chance to see the world while serving your country. I respect all the service men and women who are willing to sacrifice so much for their country."

Todd's experience inspired his younger brother to join the Army this year.

Since May, Todd returned to his DWR assignment as a Fish and Wildlife Scientific Aid performing land use studies within Central District. Todd's DWR career began in 2005 as a Student Assistant. In addition to completing his National Guard service, he plans to finish his Geology degree at Sacramento State and hopes to someday work as a Geologist. ■

*"It made me grow up."*

TODD PERCIVAL



**Above:** Todd Percival and mother Cindy Percival, both DWR employees, enjoy being able to spend time together

## A Dream Come True

**E**ighteen years ago when **Min Yu** left her hometown in China and came to the United States, she never imagined being involved in water resources in California.

"My parents just wanted me to have more opportunities. Back then, China was totally different," said Min. "Coming to America was like a dream for college students."

Min, who was raised in Shanghai and attended Shanghai Jiao Tong University, never took a trip out of her hometown. When she turned 21, her parents arranged with her uncle to send Min overseas to further her education.

"For me, it was kind of scary to leave China. I was the first in my family to leave our country," said Min. "After getting my visa, I arrived on August 9, 1990 in San Francisco knowing nothing at all. I knew very little English. I was really homesick. I was so glad to come to Sacramento and its triple digits because it reminded me of my home in Shanghai."

Min earned her Bachelor of Science degree in Mechanical Engineering and her Master of Science degree in Civil Engineering from California State University, Sacramento (now Sacramento State).

### A Career in Water Resources

In 1995, Min began working for DWR's Division of Operations and Maintenance as an Engineer. Her assignment included creating and maintaining the first Web site for the posting of information from the State Water Project water quality database.

From 1998 to 2001, she worked in the South Delta Management Section of the Bay-Delta Office (BDO), where she worked on the draft Environmental Impact Report for the South Delta Improvements Program and participated in public meetings.

She joined the CALFED Bay-Delta Program in 2002 and was promoted to Senior Engineer.

"In my position supporting the Drinking Water Subcommittee of CALFED's Public Advisory Committee, I became even more aware of critical water issues, and informed on policy and decisions affecting water in California," said Min.

Min's strong desire to excel in her career and encouragement from former Supervisor **John Andrew** led her to participate in the Water Education Foundation's 2003 William R. Gianelli Water Leaders Class. Her mentor was former Rio Vista Mayor Marci Coglianese.



In 2003, she began her current assignment as Senior Engineer in BDO's Delta Modeling Section, where she facilitates the Delta Simulation Model (DSM2) Users Group (DSM2UG), which provides a platform for DSM2 users to interact, communicate, and exchange information about the development and application of the DSM2 model. DSM2 is DWR's primary model used to simulate hydrodynamics and water quality in the Sacramento-San Joaquin Delta. Min has also been the liaison with other engineering groups studying the Delta, which include engineers and scientists working on the North of the Delta Off-Stream Storage Project and Common Assumptions Common Model Package Development.

According to Min, DSM2 has been used for a variety of purposes. If someone wants to examine how water levels in the South Delta may change due to different project operation strategies, planning studies are done using DSM2. It has also been used to determine potential water quality impacts from Judge Wanger's initial decisions.

"It's a very popular model. It provides important information for decision makers," said Min. "It's been used statewide by consultants and water agencies, such as CH2M Hill, Jones and Stokes, Contra Costa Water District and even China."

### Future Goals

"The Delta is the hub. I really enjoy what I am working on. We are going to tackle enhancing the particle tracking module, which is one of three DSM2 elements," said Min. "I'm looking forward to this new project, which will also allow us to better study the Pelagic Organism Decline."

Min, who constantly searches for ways to expand her knowledge in the engineering field, can see herself down the road broadening her expertise outside of the Delta.

Although Min has established her career in America, she always makes time to visit Shanghai. ■



*Above: Min Yu standing at Shanghai Jiao Tong University in July of 1990. In 2007, Min Yu visited West Lake, Hangzhou located near Shanghai*



# Northern District's Gene Pixley Hits 50-Year Career Mark with DWR

**N**orthern District Land and Water Use Scientist **Eugene Pixley** observed two impressive milestones on June 30, 2008: he received his 600th paycheck and celebrated a half-century of service to DWR.

"Not a single one of those 600 paychecks was ever late," remarks a bemused Pixley. "They always came between 2:30 and 3:30 in the afternoon."

He also notes that the value of the checks has grown considerably since he signed on July 1, 1958. "I only made \$458 a month back then," he says. "But that was a big step up from the \$258 per month I got paid in my previous job as a lab technician with the Merced County Farm Adviser."

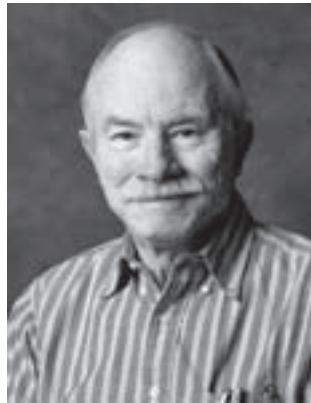
Pixley has seen a great many changes at DWR since his start as a Junior Land and Water Use Analyst in the San Joaquin District. The State Water Project did not yet exist, work having just begun in 1957 to relocate the Western Pacific Railroad and Highway 70 around the proposed site of Lake Oroville.

Gene transferred to Southern District in the early 1970s and stayed in the Los Angeles area for six years before moving to Red Bluff in 1977, where he's been ever since.

It's been a road well-traveled for Pixley. Born in Washington State, Gene was seven when his family moved to San Diego in 1939. His father worked in the aircraft industry during the war years then moved to Colorado Springs in 1945 and took up farming. "It turned out to be too cold there for agriculture," said Pixley. "But we tried it for the better part of a year before moving our animals to Tulare County and setting up a dairy."

His family has strong ties to the Central Valley: the town of Pixley is named for Gene's great-great uncle, **Frank Morrison Pixley** (who served as California Attorney General in Governor **Leland Stanford's** administration).

In the early 1950s, Gene went to the University of California, Berkeley and earned a degree in Soil Science. He also served about a year



and a half with the U.S. Army in Panama after taking that Lab Technician job in Merced County. Along the way, he raised a son and two daughters.

His 31 years at Northern District have been marked by increasing attention to detail in land and water analysis. "**Glen Sawyer**, now retired, told us back in the 1960s that the work would be the same but get a lot more involved and he was sure right," observes Pixley. "Back then, we were doing reconnaissance level studies...now, we're into detailed work in

urban water management plans and leak detection, that sort of thing."

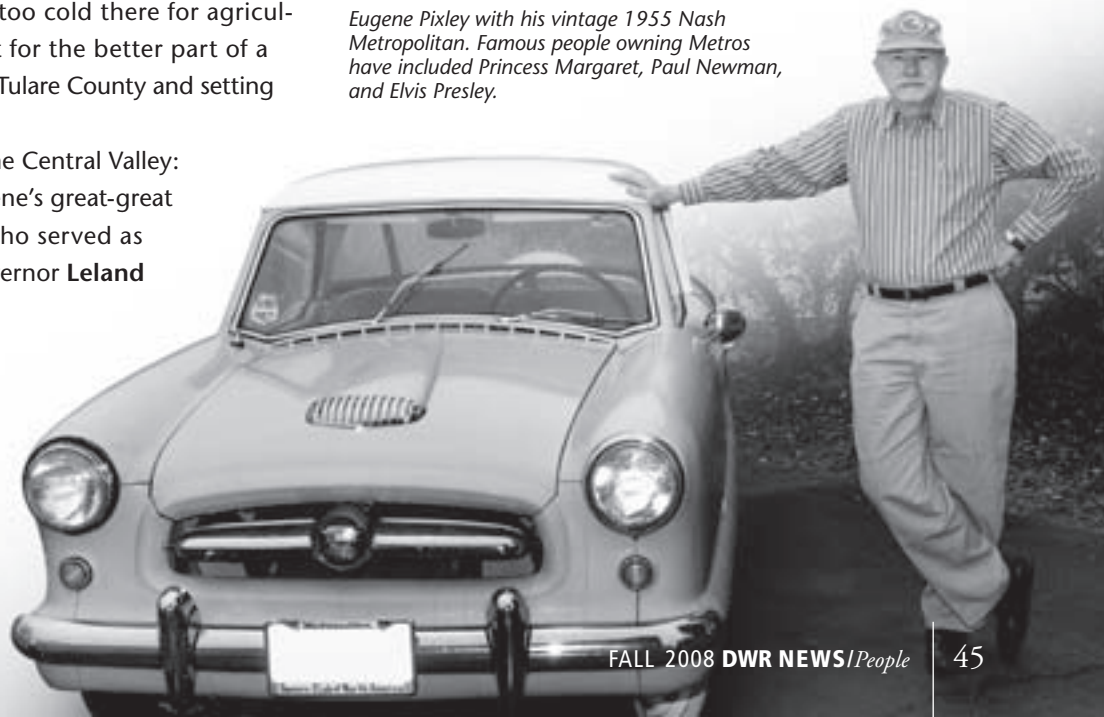
It hasn't been all work and no play. "In 1997, my wife and I drove by a car dealership in Chico where they were selling vintage automobiles," recalls Pixley. "We saw a really cute little blue car, a 1955 Nash Metropolitan, and we went in and bought it for \$7,000."

No garage queen, the little Metro takes Gene the six-mile roundtrip to work and back every day. "I just use her locally," he says. "But she gets displayed in Red Bluff area classic car shows."

After 50 years in DWR's ranks, what's ahead for Gene Pixley...? "Well, I don't have any plans to retire," says Gene. "And I sure don't want to leave Red Bluff...so I guess I'll just stay put." ■

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*Eugene Pixley with his vintage 1955 Nash Metropolitan. Famous people owning Metros have included Princess Margaret, Paul Newman, and Elvis Presley.*



## Twenty-Five Years of Service



**Linda Grace Cadano**  
Executive / Office of  
Workforce Equality  
Associate Governmental  
Program Analyst  
September 2008



**Ray Hoover**  
Operations and Maintenance  
Water and Power Dispatcher  
September 2008



**Chris Impens**  
Technology Services  
Control Systems Technician III  
November 2008



**Lori Miles**  
Planning and Local Assistance  
(Northern District)  
Secretary, Office of the Chief  
September 2008



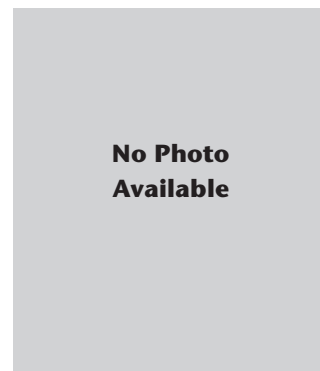
**Kevin Muir**  
Operations and Maintenance  
(Oroville Field Division)  
Control System Technician II  
September 2008



**Tony Pellegrini**  
Flood Management  
Utility Craftworker  
September 2008



**Sarah Torgersen**  
Operations and Maintenance  
(Delta Field Division)  
Administrative Officer III  
October 2008



**Sally Azua**  
Engineering  
Office Technician  
September 2008

## 40 Years of Service



**Garland "Geno" Young**  
Southern Field Division  
Water Services Supervisor/  
Security  
July 2008

## Professional Engineer Graduate



**Joshua Martinez**  
Engineering  
Mechanical Engineer  
October 2007



**Hoa Xie**  
Bay-Delta Office  
Engineer  
July 2008



## Retirements



### Elizabeth Patterson

After a 22-year career working on land and water resource issues, Staff Environmental Scientist

**Elizabeth Patterson** retired from DWR's State Water Project Analysis Office in June.

"I am most proud of my work on the Delta and the challenge of water supply, land use, and

floodplain management because the Delta is such a special place," said Elizabeth.

During her last eight years of her more than 22 years with the State, Elizabeth worked for DWR. She was a Staff Environmental Scientist for the Governor's Delta Vision Blue Ribbon Task Force and its Stakeholder Coordination Group. Other DWR assignments included being part of State Water Project Analysis Office, State Floodplain Management Task Force, Floodplain Management Environmental Compliance Planning and Analysis, and the Sacramento-San Joaquin River Basins Comprehensive Study.

Before joining DWR, Elizabeth worked as Executive Director for Partnership for Regional Livability from 1999-2001, Planning Director of the town of Fairfax from 1997 to 1999, environmental consultant from 1995 to 1997, committee staff of California State Senate River Protection and Restoration Subcommittee from 1994 to 1995, Program Director of the California State Lands Commission from 1990 to 1995, and Planning Director of the City of Clayton, Contra Costa County from 1987 to 1990. Prior to her career in planning, Elizabeth was a librarian and environmental campaign organizer.

In addition to being Project Manager for the San Joaquin River Conservancy Environmental Impact Report Master Plan, she directed development of 31-mile Sacramento River

Greenway plan and was program manager for the Public Trust Report on California Rivers, assessing the status of the health of rivers listed in the California Rivers Report.

Elizabeth taught courses ranging in topics from Wetlands and Flood Control to Implications of the Public Trust and Planning for various organizations, including the University of California, Berkeley Extension and California State University at Sonoma. She re-established the Awards Committee of the Association of Environmental Professionals and served on panels at its Annual state conferences and California Environmental Quality Act Workshops.

Elizabeth was also a former board member of the Center for Natural Lands Management, League of Conservation Voters, and Contra Costa Resource Conservation District.

Serving her second term on the Benicia City Council, she was selected Mayor in 2007. Mayor Patterson is a "Cool Mayor" as signatory to the Mayor's Climate Protection Agreement on the Environment and is leading the city's efforts to reduce its carbon footprint.

In addition to being the Vice President of Governmental Affairs for Morrison & Associates and working as a retired annuitant on the Delta Vision and the California Water Plan, Elizabeth's retirement plans include bicycling at the Benicia marsh, nurturing her garden, keeping her Koi content, and spend time with her daughters and family.

Elizabeth, a second generation Californian, was born in Los Angeles and raised in San Gabriel Valley, then moved to Northern California in 1968. She managed a ranch in San Luis Obispo County for two years, then moved to Ithaca, New York for five years before returning to the Bay Area.

She earned a Master of Arts degree in Urban and Regional Planning from California State University, San Jose and a Bachelor of Arts degree in History from California State University, Los Angeles. ■

## Retirements

**Horace Brown**  
Oroville Field Division  
Business Services Assistant

**Donald Duncan**  
Technology Services  
Systems Software Specialist  
III (Supv.)

**Judy Fong**  
Bay-Delta Office  
Management Services  
Technician

**Janet Hayhurst**  
Fiscal Services  
Office Assistant (Typing)

**Darrell Kaff**  
Environmental Services.  
Senior Control Engineer  
(Supv.)

**Ronald Lee**  
Engineering  
Principal Engineer

**Dalila Lulu**  
Office of Water Use  
Efficiency  
Associate Governmental  
Program Analyst

**Deborah Soehren**  
Operations & Maintenance  
Associate Governmental  
Program Analyst

INFORMATION PROVIDED BY DWR'S PERSONNEL OFFICE

## Retirements



### Janet M. Wolf-Eshe

During her nine-year stay at DWR, **Janet Wolf-Eshe** was an Assistant Information Systems Analyst providing technical computer assistance for the Department, specifically for the State Water Project Analysis Office.

A typical day for Janet included working on shared printer or desk printer problems, reconnecting Personal Computers (PCs) to shared database information within DWR, and installing new or needed computer programs.

But it was the personal attention that Janet appreciated about her job the most. The highlight of her day was getting the opportunity to speak with fellow employees as she worked on their computer. But getting the job done was the top priority.

"It was always good to get to the last PC in a newly purchased group of PCs, getting it prepared and set-up for a co-worker," Janet said. "I was glad when I knew I could get

all the co-workers' files, bookmarks, etc., transferred from the old PCs to the new PCs."

Before she came to DWR, Janet worked at various State departments for more than 20 years. In that time, she worked for the Department of Education, the State Controller's Office and the Department of Motor Vehicles.

Janet enjoyed her time at DWR very much. "SWPAO employees were always appreciative, professional and friendly," Janet recalls. While at DWR, she was active in the state employees' union, SEIU Local 1000.

Janet's husband, **Alvin C. Eshe**, also worked for DWR. Alvin was a Civil Engineer on the State Water Project, working primarily on aqueduct turn-out projects. He retired in February of 2007 after more than 25 years with DWR.

With her retirement in June, Janet and Alvin will be moving away from California. They aren't exactly sure where, but "it will be somewhere close to family." Janet said she will spend more time with family and more time traveling throughout the United States and Canada. Janet and Alvin plan to actively support several environmental, peace, and labor organizations. ■

## New Hires

**Pramod Amatya**  
Flood Management  
Engineer

**Hana Babbin**  
Flood Management  
Engineer

**Jesse Bishop Sr.**  
Technology Services  
Staff Information Systems  
Analyst

**Elizabeth Bonora**  
Flood Management  
Office Technician (Typing)

**Timothy Bryant**  
Delta Field Division  
Control System Technician I

**Elizabeth Bryson**  
Flood Management  
Engineer

**Richard Byland**  
Southern Field Division  
HEP\* Operator

**Elena Cano**  
Management Services  
Personnel Specialist

**Abigayle Carevic**  
Central District  
Engineer

**James Carroll**  
Operations & Maintenance  
Staff Services Analyst

**Mitchell Choi**  
Executive  
Office Technician (Typing)

**Andrew Christensen**  
Engineering  
Engineer

**Ann Cobb**  
Engineering  
Office Assistant (Typing)

**Jayson Dozier**  
Management Services  
Staff Services Analyst

**Sheree Eyre Edwards**  
Operations & Maintenance  
Supervising Engineer

**Kerri Fong**  
Environmental Services  
Environmental Scientist

**Edward Friel**  
Oroville Field Division  
Electrical Mechanical Testing  
Technician I

**Michael Gabor**  
Management Services  
Staff Services Analyst

**Paul Garrison**  
Environmental Services  
Environmental Scientist

**Gary Gauthier**  
Safety of Dams  
Engineer

**Ariel Gonzales**  
Fiscal Services  
Associate Accounting Analyst

**David Grant**  
Northern District  
Environmental Scientist

**MD Haque**  
Flood Management  
Engineer

**Thanhlan Hoang**  
Fiscal Services  
Accountant Trainee

**Christina Honeycutt**  
Management Services  
Staff Services Analyst

INFORMATION PROVIDED BY DWR'S PERSONNEL OFFICE

\* Hydroelectric Plant



## New Hires

**Angela Hong**  
Flood Management  
Office Technician (Typing)

**Lawanda Jaramillo**  
Northern District  
Administrative Officer II

**Lolita Johnson**  
Fiscal Services  
Senior Accounting Officer

**Woon Jung**  
Executive  
Associate HEP\*\* Utility  
Engineer

**Owen Kong**  
Engineering  
Engineer

**Petra Lee**  
Central District  
Environmental Scientist

**Yihong Liu**  
California Energy Resources  
Scheduling  
Accountant Trainee

**Alejandra Lopez**  
Engineering  
Right of Way Agent

**Keith Louie**  
San Luis Field Division  
Electrical Engineer

**Lisa Loya**  
Operations & Maintenance  
Staff Services Analyst

**Katherine Maher**  
Bay-Delta Office  
Engineer

**Katherine Marquez**  
Environmental Services  
Environmental Scientist

**Jennifer Marr**  
Planning & Local Assistance  
Engineer

**Daniel Martinez**  
Southern Field Division  
Utility Craftsworker

**Michael Matthews**  
Technology Services  
Senior Information System  
Analyst

**Francine Mejia**  
Environmental Services  
Environmental Scientist

**Louise Moreno**  
Management Services  
Staff Services Analyst

**Doris Munoz Paredes**  
Fiscal Services  
Accountant Trainee

**John Murray**  
San Joaquin Field Division  
Building Maintenance  
Worker

**Kijin Nam**  
Bay-Delta Office  
Engineer

**Sonny Olaso**  
Engineering  
Staff Services Manager I

**Steven Pansoy**  
Engineering  
Staff Services Analyst

**Jesus Parrilla**  
Fiscal Services  
Associate Accounting Analyst

**Mahesh Patel**  
Fiscal Services  
Staff Services Analyst

**Juan Pellicier**  
Technology Services  
Assistant Information  
Systems Analyst

**David Pesavento**  
Flood Management  
Engineer

**Mark Rabo**  
Northern District  
Engineer

**Ruben Ramirez**  
Flood Management  
Maintenance and Service  
Occupational Trainee

**Michelle Ridgway**  
Flood Management  
Engineer

**John Riehl**  
Management Services  
Staff Services Analyst

**Carla Rivera**  
Engineering  
Mechanical Engineer

**Anthony Roadman**  
Central District  
Associate Information  
Systems Analyst

**Lori Rodgers**  
Management Services  
Office Assistant (Typing)

**Vincent Rodriguez**  
Flood Management  
Senior Engineer

**Mahyar Sabbaghian**  
Flood Management  
Senior Engineer

**Mary Jo Schall**  
Management Services  
Staff Services Manager I

**Christal Segovia**  
Management Services  
Staff Services Analyst

**Nastassia Simmons**  
Engineering  
Office Technician (Typing)

**Jatinder Singh**  
Technology Services  
Systems Software Specialist  
III (Supv.)

**Wendy Stewart**  
Flood Management  
Research Analyst I

**Sanita Velagic**  
Executive  
Office Technician (Typing)

**Wesley E. Watson Jr.**  
Southern Field Division  
HEP\* Operator

**Christina Wing**  
Engineering  
Engineer

**David Wright**  
Flood Management  
Senior Engineer

## Promotions

**Justiniana Asis**  
Engineering  
Senior Land Agent (Supv.)

**Scott Bains-Jordan**  
Technology Services  
Systems Software Specialist  
III (Supv.)

**Henry Ball**  
Oroville Field Division  
Business Service Assistant

**Terry Becker**  
Engineering  
Principal Engineer

**Tracie Billington**  
Planning & Local Assistance  
Principal Engineer

**Hamid Bonakdar**  
Flood Management  
Supervising Engineer

**Ronald Brunner**  
Southern Field Division  
HEP\* Operator

**Joseph Burke**  
Engineering  
Senior Engineer

**Kari Carroll**  
Public Affairs Office  
Staff Services Analyst

**Gary Chee**  
San Joaquin Field Division  
Supervising HEP\*\* Utility  
Engineer

**Stephen Cimperman**  
Planning & Local Assistance  
Supervising Engineer

\* **Hydroelectric Plant**  
\*\* **Hydroelectric Power**

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# Promotions

**Garrett Clyde**  
Southern Field Division  
Control System Technician I

**Ryan Colquhoun**  
Engineering  
Engineer

**Brenda Cress**  
San Joaquin Field Division  
Senior HEP\* Operator

**Scott Crist**  
San Luis Field Division  
Water Resources Engineering  
Associate (Supv.)

**Sharmane Daniels**  
Management Services  
Associate Governmental  
Program Analyst

**Robert Dolliver-Lum**  
Technology Services  
Systems Software Specialist II

**Rebecca Dominguez**  
Safety of Dams  
Associate Governmental  
Program Analyst

**Justine Duplissey**  
State Water Project  
Analysis Office  
Office Technician (Typing)

**Abolghasem Ehsan**  
Engineering  
Associate Electrical Engineer  
Hydraulic Structures

**David Encinas**  
San Joaquin District  
Senior Engineer

**Michael Engelmann**  
Flood Management  
Senior Engineer

**Roland Geronilla**  
Southern Field Division  
Senior HEP\* Operator

**Thomas Hawkins**  
Planning & Local Assistance  
Land & Water Use Program  
Manager I

**William Hicks**  
Engineering  
Construction Supervisor II

**Jeffrey House**  
Oroville Field Division  
HEP\* Electrician II

**Ronald Ingle**  
Fiscal Services  
Accounting Administrator II

**Jodi Johnston**  
San Joaquin Field Division  
Materials & Stores Specialist

**Randy Kataoka**  
Technology Services  
Senior Information Systems  
Analyst (Supv.)

**Martha Kie**  
Flood Management  
Senior Environmental  
Scientist

**Eric Koch**  
Flood Management  
Principal Engineer

**John Leahigh**  
Operations & Maintenance  
Principal Engineer

**Philip Lecocq**  
Engineering  
Senior Engineer

**Joel Ledesma**  
Operations & Maintenance  
Principal HEP\*\* Utility  
Engineer

**Brandon Littlejohn**  
Management Services  
Staff Services Analyst

**Jose Lopez**  
Southern Field Division  
HEP\* Operator

**Stephanie Mendiola**  
Management Services  
Associate Personnel Analyst

**Sonia Miller**  
Environmental Services  
Environmental Scientist

**Jack Montgomery**  
San Luis Field Division  
Senior HEP\* Operator

**Jamie Mulkey-Flink**  
San Joaquin Field Division  
Administrative Officer III

**Douglas Myatt**  
Fiscal Services  
Staff Services Manager II  
(Supv.)

**Lien Nhieu**  
Fiscal Services  
Associate Accounting Analyst

**Ruben Reveles, Jr.**  
Oroville Field Division  
Warehouse Worker

**Dean Reynolds**  
Office of Water Use Efficiency  
Senior Land & Water Use  
Scientist

**Robert Ross**  
Delta Field Division  
HEP\* Operator

**Jennifer Russo**  
Environmental Services  
Office Technician (Typing)

**Thomas Ryan**  
San Joaquin Field Division  
HEP\* Electrician II

**Steve Salcido**  
Southern Field Division  
HEP\* Electrician I

**Arnold Sanchez**  
Engineering  
Supervising Engineer

**Nalini Shankar**  
Fiscal Services  
Accounting Administrator I  
(Supv.)

**Thomas Shannon**  
Oroville Field Division  
HEP\* Electrical Supv.

**Craig Silver**  
Engineering  
Construction Supervisor II

**Kamaldeep Singh**  
Operations & Maintenance  
Engineer

**Steven Speck**  
Oroville Field Division  
HEP\* Mechanic Supv.

**John Stephens**  
Central District  
Supervising Engineer

**Jannette Stetson-Buck**  
Southern Field Division  
Office Technician (Typing)

**Michael Sutliff**  
Safety of Dams  
Senior Engineer

**Ram Verma**  
California Energy Resources  
Scheduling  
Supervising HEP\*\* Utility  
Engineer

**Pedro Villalobos**  
State Water Project Analysis  
Office  
Principal HEP\*\* Utility  
Engineer

**Xiaochun Wang**  
Planning & Local Assistance  
Senior Engineer

**Jack Warner**  
Operations & Maintenance  
Senior Water & Power  
Dispatcher

**Matthew Warnick**  
Management Services  
Office Technician (Typing)

**Robert Wayne Jr.**  
Operations & Maintenance  
Assistant Information  
Systems Analyst

**Teresa Wegener**  
Flood Management  
Supervising Engineer

**Elizabeth Wellman-Barbree**  
Flood Management  
Senior Engineer

**Robert Yeadon**  
Flood Management  
Supervising Engineer

**Carlton Yuan**  
Engineering  
Transportation Surveyor  
(Caltrans)

\* **Hydroelectric Plant**  
\*\* **Hydroelectric Power**

INFORMATION PROVIDED BY DWR'S PERSONNEL OFFICE



# Obituaries

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## Gentry Durham

**Gentry William Durham**, a DWR research writer in the 1960s who later served as a press officer for three statewide elected officials, died on July 13, 2008 in Sacramento. He was 91 when he died in his sleep.

Well-known in State government and respected for his media expertise, Durham served as a press representative for California State Treasurer **Ivy Baker Priest**, starting in 1967, and thereafter for State Controller **Houston Flournoy** and Flournoy's successor, **Ken Cory**.

Mrs. Priest, who served as U.S. Treasurer under President **Dwight Eisenhower** from 1953 to 1961, was one of the first women elected to statewide office in California. Priest and Flournoy were Republicans and Cory a Democrat, but Durham's approach to his duties was news-oriented and non-partisan.

DWR Public Information Officer **Dean Thompson**, who retired in 1985, recalls recommending Durham, then a DWR writer, to Mrs. Priest, who needed a press professional. Accepting Thompson's recommendation, Mrs. Priest hired Durham. He was a crisp writer with a courtly Southern style of speech. A year later, she called Thompson back and

thanked him, saying Durham was doing a great job for the Treasurer's Office.

Durham entered State service in 1966 with extensive news experience in Contra Costa County, first as a reporter and editor for the Antioch Ledger, starting in 1940, and in the 1950s as owner-publisher of the Brentwood News.

During World War II, he served in the Navy in the South Pacific.

Born in 1917 in Missouri, Durham grew up in Arkansas. He attended the University of Arkansas, where he met his future wife. He and the former Nancy Virginia Gilmore graduated from the university in 1939, married in 1940 and moved to California. They raised three children.

Durham was predeceased by a son, William. Survivors include his wife, two children, Mary Jo Swalley and James Durham, five grandchildren and three great grandchildren. A memorial service was held on August 17. Donations may be made to the Michael J. Fox Foundation for Parkinson's Research, Church Street Station, P.O. Box 780, New York, New York 10008. ■

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## Anne Marie Foster

**Anne Marie Foster**, a DWR retiree passed away at the age of 85 on August 18, 2008 in Sacramento.

A 1941 graduate of McClatchy High School, Anne began her State career in March of 1953. After leaving the State, Anne returned as an Intermediate Typist Clerk in January of 1958. She worked for the Engineering Section in 1961, until transferring to Operations and Maintenance in 1971. She became a Word

Processing Technician in 1981. In April of 1986, she retired from DWR with 31 years of State service. From 1987 to 1988, she worked as a Retired Annuitant. She was an active member of the DWR Alumni Club.

Anne is survived by two children, four grandchildren, and five great-grandchildren. ■

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## Larry Joyce

**Larry Joyce** passed away at the age of 58 on September 30, 2008 while surfing at Kalaeloa-White Plains near his home of Kaneohe, Hawaii.

Larry who was born in Ames, Iowa, lived most of his early life in Hawaii. He graduated from Iolani High School, Honolulu, Hawaii and from Linfield College, McMinnville, Oregon with a Bachelor of Arts in Environmental Sciences. He was a Coast Guard veteran.

Larry began his 28 year State career in 1977 with the California Energy Commission (CEC) as an Energy Analyst working in the Assessments Division. The CEC awarded him for his exceptional contribution to the biennial report/State Implementation Plan coordination project. In 1984, He

transferred to DWR's Energy Division. After joining Operations and Maintenance as Senior Environmental Scientist and Chief of the Water Quality Section in 1992, he managed a complex water quality monitoring program, data collection and analysis and the preparation of many reports. He oversaw the preparation of Appendix E to Bulletin 132, Water Operations and Water Quality in the Sacramento-San Joaquin Delta. He was instrumental in transforming the method of water quality data collection to reflect real-time water quality conditions on the State Water Project. In 2005, Larry retired from DWR

Larry is survived by his wife, Charlotte, two children and a granddaughter. ■

# DWR MISSION

## *Statement*

To manage the water resources  
of California in cooperation  
with other agencies,  
to benefit the State's people,  
and to protect, restore,  
and enhance the natural  
and human environments.

S T A T E   O F   C A L I F O R N I A   •   D E P A R T M E N T   O F   W A T E R   R E S O U R C E S

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